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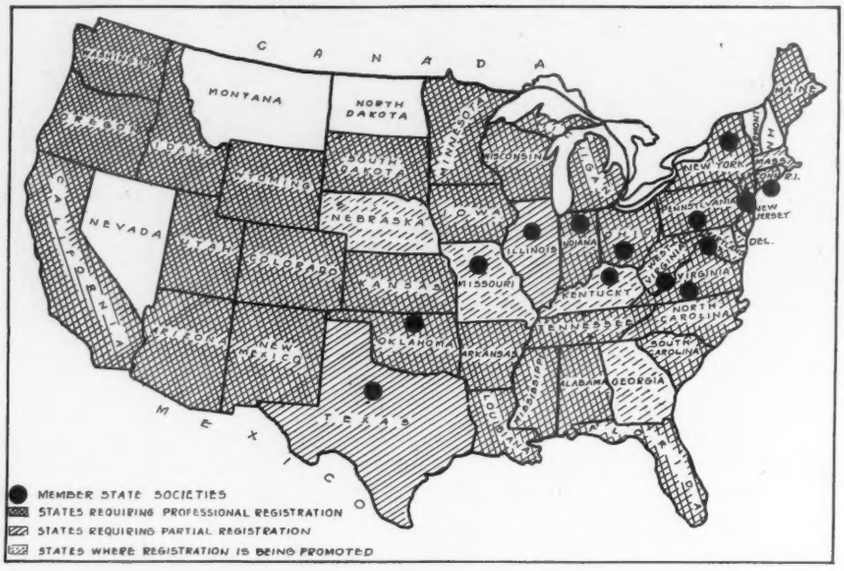

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THE COVER

Streamlining, like sit-down strikes, is a National fetish. This month's cover displays a splendid example of a streamlined, coal-burning, steam locomotive—developed by the Pennsylvania Railroad—a traffic artery serving many of the States in which N. S. P. E. is intrenched.

The American Engineer assumes no responsibility for statements or opinions expressed by contributors. Their names identify the source of the same.

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Current Opinion

The Engineer—A Challenge

He is the master of the Laws of Nature. On a sound foundation of mathematics, science, and economics, he bends the materials and forces of Nature to his plan and rears the structure of civilization. With vision, resourcefulness, and ingenuity, he labors to increase the comfort, wealth, and safety of his fellowmen. He attacks his problems with the vision of the pioneer, the integrity of the scientist, the accuracy of the mathematician, the practicality of the business man, the resourcefulness of the inventor, and the courage of the conqueror. He is the planner and builder. He builds his visions into enduring realties. He is the pathfinder of civilization. He breaks down barriers, bridges chasms, establishes communication, and straightens the way for commerce and human progress. He is the protagonist of efficiency, He reduces effort, eliminates waste, and increases production. He is the creator of a Nation's wealth. He drains the swamps, reclaims the deserts, develops resources, and harnesses power. He builds the machinery of industry, the wheels of commerce, and the structure of business. He is the great coordinator. He plans and directs the construction of projects representing the investment of millions of dollars and involving the labor of thousands of men. He investigates with open mind, and gets the facts before he makes decisions. He plans with thoroughness and builds with fidelity. To his rich heritage from the labors of past generations of engineers and scientists, he adds his contributions. He continues the work of forcing outward the challenging barriers that separate Man's efforts from the impossible.

—D. B. STEINMAN, *Past President,*
National Society of Professional Engineers.

NOTE:—The Editor has enjoyed this description of "The Engineer" so much he is devoting this page of "Current Opinion" solely to Dr. Steinman's descriptive challenge.

EDITORIAL . . .

Registration—

Is It Really a Serious Problem?

Registration of Professional Engineers is fundamentally for the purpose of protecting human life and physical property. Proposed registration of Power Engineers is basically to prevent unqualified persons from operating engines or other machinery—and incidentally, to increase wages for such operation and to shorten hours.

One is a profession—the other a trade.

There should be no conflict of interests. Yet there appears to be much "hullabaloo" about one field trespassing upon the other.

Why?

Simply because each side of the controversy is extremely jealous of the word "Engineer" —and justly so!

Is it possible that both are entitled to it? A Doctor of Philosophy knows nothing of medicine, yet his title is the same as a Doctor of Medicine—or a Veterinarian—and many others.

Certainly there are thousands of border line cases—overlapping cases—where two fields cross over into each other's back yards. But does this necessarily call for vituperation—for the throwing of stones—for the calling of names? Such actions serve to intensify imaginary wounds and engender hatred. When such emotions arise, good judgment is warped.

Registration of Engineers—all Engineers—is comparatively recent. It has been developed by various provisions in the many States having registration. The enactment of registration laws universally was such a problem that concessions to principles were frequently made.

This great National Society certainly does not want to stand in the way of progress in any line of endeavor, especially where the members of a business, trade, or profession wish to better their social and economic standing. We are whole-heartedly for such advancement!

But—There must be a clear cut line of demarcation between the profession and the trades.

With the foregoing in mind, the Directors of the National Society of Professional Engineers at their recent quarterly meeting held in Washington, D. C., on April 3rd, appointed one of their Directors as a special committee. This committee will meet with the chief officer or officers of such organizations that feel we are in conflict with their registration aims, hoping to bring about a more clear understanding of the aims and objects of each group and with a view to early clarification and understanding of such aims.

The National Society of Professional Engineers pledges full cooperation. We know this is a forward step—the road is a little rocky—but rock makes a firm foundation!

—R. H. C.

NATIONAL SOCIETY NEWS

Another State is Now Registered

Nebraska Passes Engineers' Registration Law

On March 25, 1937, the Nebraska Senate by a vote of 29 to 9 passed the bill for the establishment of registration for engineers and architects. This measurre was recommended to the Senate by Governor Cochran, who is himself a professional engineer. Within 60 days, under the terms of the bill, the Governor is to appoint a five member board, three engineers and two architects. The requirements for registration are based on those in the Model Law. Persons now engaged in professional practice are exempted from the written examination, but persons not practicing now who wish to practice engineering or architecture in the future will be required to take an examination under supervision of the Board. In addition to the examination requirement, candidates must show eight years of actual experience in engineering or architecture, but the applicant will be credited with one year of experience for each year he spends in college professional training up to four years. The registration fee is $15 and the annual renewal fee is to be between $3 and $5 as may be set by the Board. Licenses may be revoked for unprofessional conduct. Municipalities and other governmental subdivisions are required to hire registered engineers on construction projects totaling more than $10,000.

Nebraska is the 36th state to enact a registration law for professional engineers.

Hon. R. L. Cochran,
Governor of Nebraska,
Lincoln, Nebr.

Dear Governor Cochran:

Please accept my personal congratulations and those of the National Society of Professional Engineers on your securing the enactment of a registration law for architects and engineers in the State of Nebraska. This brings the total of engineers' registration states to date to thirty-six, and we expect several more states to enact such registration laws during the present legislative sessions. The engineering profession in Nebraska is fortunate in having your leadership.

With all sincerest regards,

Faithfully yours,

D. B. STEINMAN,

National Society of Professional Engineers.

STATE OF NEBRASKA

Executive Office

Lincoln

April 2nd, 1937.

Mr. D. B. Steinman
National Society of Professional Engineers
117 Liberty Street
New York, N. Y.

Dear Mr. Steinman:

Thank you for your letter of March 30th with your kind expression regarding the enactment of registration law for architects and engineers in the state of Nebraska. I made such recommendation in my message to the legislature and naturally was pleased to sign such bill.

I appreciate very much your kindness in writing me.

Very sincerely yours,

(Signed) R. L. COCHRAN,

Governor of Nebraska.

Loss

"Engineer Gerald W. Knight, First vice-President of the New Jersey Association of Professional Engineers and Land Surveyors died at his home at 127 Aycrigg Avenue, Passaic, New Jersey on Saturday evening, April 10, 1937.

Engineer Knight was one of the founders of the Passaic County Chapter in the State of New Jersey. After holding various offices in the chapter he was State Trustee for a number of years. In 1933, Gerald Knight was elected Secretary of the State Association and recently was made First vice president.

With the founding of the National Society of Professional Engineers in 1934, Engineer Knight, who was active in this organization, was made Director to the National Society of Professional Engineers from the State of New Jersey, and has held that office ever since.

The engineers of New Jersey and the Nation have lost a tireless and valuable worker.

Engineer Knight was engineer advisor to Hon. Harold G. Hoffman, Governor of New Jersey, until he was appointed as Secretary to the Tri State Sanitary Commission several years ago."

The National Society of Professional Engineers extends deep sympathy to Engineer Knight's family.

Group of Officers and Speakers at Connecticut Convention

Seated Left to right, Lewis C. Smith, Secretary; Allen Hubbard, President of the Connecticut Society of Professional Engineers and Dr. David B. Steinman founder—President of the National Society of Professional Engineers.

Standing, Dean Samuel W. Dudley, Yale Engineering School; John C. H. Wendes, Regional Director, Naugatuck; Harry E. Harris, Retiring president and National Director; Samuel I. Sacks, Chairman, National Legislative Committee and Carl Gotthardt, Retiring secretary.

NATIONAL SOCIETY NEWS

CHANGE OF ADDRESS

If the address at which you receive your AMERICAN ENGINEER has been changed, notify the Executive Secretary (*not* the Editor) without delay!

—Don't Forget—

All notices of change of address should be sent promptly to:

WILLARD S. CONLON
Executive Secretary
National Press Building
Washington, D. C.

The Gold Star for membership increase should go to the Indiana Society of Professional Engineers.

Organized in January, they already have 120 members paid in and 185 additional applications under consideration. We in the East want to import some of their brand of inspiration.—*National Society News.*

A CONSCIENTIOUS ENGINEER ENDS HIS LIFE TO EXPIATE AN ERROR

(From the *London Times*)

Professor Paul Fillunger, lecturer on bridge building at the Vienna Engineering College, and his wife have ended their lives by taking a drug and then opening the gas jets. The professor left a letter explaining that he regarded it as his duty to expiate with his life the injury he had done to a fellow professor, Dr. Karl Terzaghi, whom he had attacked in a pamphlet on a scientific question only to discover that he himself was in the wrong.

* * *

To All Secretaries:

The Board of Directors of N. S. P. E., at its meeting of April 3, 1937, held at Washington, D. C., directed the undersigned to advise all affiliated State Societies that N. S. P. E., advocated the favorable consideration of State Legislation for the prequalification of contractors.

Such laws are now in effect in the States listed herewith, and require substantially the submission of satisfactory evidence that the contractor is qualified to properly execute a contract maintains, a permanent place of business, has had appropriate experience, and has available or can obtain adequate construction equipment and financial resources to undertake and perform a contract properly and expeditiously.

Copies of existing laws may be procured by addressing communications to the Secretary of State of any of the following States.

1.	Alabama	8.	Ohio
2.	California	9.	Oregon
3.	Kentucky	10.	South Carolina
4.	Michigan	11.	Utah
5.	Nevada	*12.	Tennessee
6.	New Jersey	*13.	Georgia
7.	Indiana	*14.	Mississippi

The writer has been advised that this legislation applies principally to highway construction and in the cases of 1 to 11, special legislation has been enacted. The last State to enact such legislation was the State of Indiana. In the case of 12 to 14, specific legislation has not been enacted but amendments to the general statutes have been made.

Sincerely yours,

WILLARD S. CONLON,
Executive Secretary,
National Society of Professional Engineers.

National Past President Addresses Connecticut Engineers

America's eminent Professional Engineer, Dr. David B. Steinman of New York spoke on "The Accomplishments and Aims of the Professional Engineering Societies," Saturday, March 20th, at the Annual Meeting of the Connecticut Society of Professional Engineers in the Hotel Garde, in New Haven.

Dr. David B. Steinman of New York, bridge engineer of international note, Founder Past-president of the National Society of Professional Engineers and Chairman of its Committee on Professional Relations, spoke on "The Accomplishments and Aims of the Professional Engineering Societies" before the Connecticut Society of Professional Engineers at its Annual Meeting in the Hotel Garde in New Haven on March 20th.

Bridges exemplifying outstanding engineering activities of the kind for this century, with whose design and construction he had important parts, span huge stretches of water throughout the world. In 1932 eleven national and local engineering societies presented him with a silver scroll for his contribution to the advance of the engineering profession's status.

The most recently completed span of note with whose construction he was identified is the $45,000,000 Tri-borough bridge in New York, for the design of which he served as consulting engineer.

Engineer Steinman was introduced by Charles L. Nord, Chief Bridge Engineer of Connecticut. Engineer Nord is a registered professional engineer and has been with the State Highway Department for seventeen years. He is noted for his work on the Menomine Falls Viaduct for the M. St. P. R. R. in Wisconsin and for several large buildings of the St. Louis World's Fair. He is the author of several published papers, "Steel and Nickle Steel and its Use in Construction," "Modern Loading of Highway Bridges," "Tests on High Steel Transmission Towers," etc. Engineer Nord is responsible for the economical repair of Bridgeport's Stratford Avenue and Grand Street Bridges.

Engineer Allen Hubbard, of New Haven acted as Chairman and Harry E. Harris, of Bridgeport, Retiring President of the Society acted as toastmaster.

Prof. Samuel W. Dudley, Dean of Yale Engineering School delivered an address on "What Engineering Education is Trying to Do."

Engineer John C. H. Wendes of Naugatuck, who has practiced engineering all over the world, recounted some of his interesting engineering experiences and exploits.

The meeting concluded with "The Alchemist's Hourglass," a beautiful talking, musical Technicolor film depicting Seventeenth Century events.

Waterbury Engineers who cooperated with the Committee on Arrangements are Joseph H. Roberts, L. Heres DeWyk, Sr., Frederick W. Carter, Herbert H. Scott-Smith, John W. Shallenberger, Frank E. Kleist, Charles A. Spargo, Wendell P. Viall and Claude E. Wilson.

Noted Engineer-Lawyer Speaks

Philadelphia's prominent civil engineer and attorney expounded the technicalities of the laws as they affect the practice of engineering at the Annual Meeting of the Professional Engineers in New Haven.

Engineer-Attorney Samuel I. Sacks of Philadelphia, the leading exponent of engineering law, Chairman of the National Legislative Committee, Director of the Pennsylvania Society of Professional Engineers and legal adviser to the profession in general, addressed the Connecticut Society of Professional Engineers on "Laws Affecting the Engineering Profession, Present, Pending and Proposed." Director Sacks has spent a large part of the last eighteen years in the study and practice of engineering law and is active in these matters in nearly every state in the Union and acts in an advisory capacity in the District of Columbia. Engineers in general know little about the laws or about legislation in this and other states affecting them. With forty states and the District of Columbia having, amending or considering laws directly or indirectly relative to or encroaching the rights of professional engineers, constant vigilance is the price of safety. The Engineers were not only fortunate in having Engineer Sacks to address them on this occasion, but they are to be congratulated upon having an attorney of his professional standing and his zeal for the Engineering Profession to be at the portals of legislation to scrutinize all proposals pro and con and to act for and advise them.

Engr. Sacks was Civil Engineer for the City of Philadelphia for eight years in charge of design of sewers, subways and elevated lines. He is an officer of the United States Naval Reserve Forces, served as a Civil Engineer in the Navy, a member of the Law Association of Philadelphia, of the American Society of Civil Engineers, and of the Legion of Honor. Modest, unassuming, and courteous, he is a pleasant man to meet and to know.

The New Haven Committee on Arrangements which induced Engineer Sacks to come to Connecticut for this occasion comprises Lewis C. Smith, Chairman; William J. Mahan, Robert Castro, Willis F. Thompson, Richard H. Whitehead, Allen Hubbard and John C. H. Wendes all of New Haven, assisted by William P. Little of Stratford, Carl Gotthardt of Bridgeport, Chester S. Wendell of Stamford, George L. Bilderbeck of New London, Herbert H. Scott-Smith of Waterbury, George L. Mylchreest of Hartford and Walter L. Edel of Storrs.

The Pennsylvania Railroad's New Streamlined Coal-Burning Locomotive

The Pennsylvania Railroad's new streamlined coal-burning passenger locomotive, is of the most highly perfected and advanced design yet produced by aerodynamic science for the reduction of wind resistance. The streamlined steam engine, which is of a strikingly new type, was only recently completed at the Pennsylvania's Altoona, Pa., Works. It combines unusual beauty of line and form with the maximum of utility and economy of operation. An interesting added feature is a device, modeled on the principle of an airplane wing, to deflect the smoke upward so as to clear the locomotive and train. The new locomotive will shortly be assigned to regular service, but for a time will be exhibited at various points on the railroad, where it is expected to attract widespread attention as a radically new departure in railroad steam motive power.

The new engine is intended for high speed through passenger service. At a mile-a-minute speed it shows a reduction of more than one-third in wind resistance. At maximum speeds the saving is equivalent to nearly 300 horsepower.

The streamlining starts with the pilot and a round "nose" at the front of the boiler. It extends back, below the plane of the smoke deflector, in long sweeping lines to the cab, from which it is continued to include the tender so that the engine and tender present the appearance of a single unit. The contours suggest speed, power and grace and are a striking illustration of the natural beauty of a mechanical design that is functionally correct.

Portions of the outer structure of the locomotive are readily removable at all necessary points for inspection and repairs.

The locomotive is painted a dark bronze, with letters and numerals in gold. Hand rails above the running boards at the sides and front are of polished stainless steel and polished stainless stell strips are also applied to the boiler and along the sides of the locomotive and tender to accentuate the streamlined effect. A polished steel keystone with "P. R. R." monogram is mounted just above the headlight which is built into the round "nose" at the front of the boiler. The emblem, in color, also appears on the sides of the tender.

The design of the engine was developed by the railroad's engineering department in cooperation with Raymond Loewy, of New York City, a widely known authority on streamlining and a member of the railroad's technical advisory staff.

In working out the final design, tests were carried on over a period of months in the wind tunnels of the aerodynamic laboratory of New York University. For the first time in the history of wind tunnel tests, clay models were used in these experiments. They demonstrated their superiority over wood or other materials by reason of the fact that their shapes could be rapidly and easily changed immediately upon observing the results of each test. The models measured seven feet in length and weighed close to 100 pounds apiece.

In all, twenty-four different designs were built and discarded in favor of four, which were carried into the final stages of the wind tunnel tests. From these, the ultimate selection was made and complete details worked out.

In the wind resistance tests, the models were suspended in the tunnel over a moving belt and the velocity of the air in the tunnel and the speed of the belt were varied to duplicate actual conditions of a locomotive moving across the country at high and changing speeds. In some of the tests the engineers working on the design entered the wind tunnel and studied the air currents by observing their effects upon lengths of silk thread. If the thread remained firm in the "slip stream" the indication was that the streamlining was correct. A vibrating thread would show imperfect streamlining and the design would be changed experimentally until the trouble was found and remedied.

The new locomotive has a "4-6-2" wheel arrangement—i. e., it has a four-wheel front truck and six driving wheels followed by a two-wheel truck. The driving wheels are 80 inches in diameter. The total weight of the locomotive (engine and tender) in working order is 627,550 pounds and the coupled length of locomotive and tender is 95 feet.

Engineers and Tomorrow

The Opportunities for Service to Society Are in the Light of True Civilization—Obligations

***By* INGENIEUR**

THE transition from primitive existence to urban life is at once the story of mankind and the accomplishment of engineering. With this change has come the accompanying responsibilities of communal existence. No longer is man dependent only upon nature and its elements. No longer does responsibility confine itself to the individual. The Engineer is, like all other human beings, a member of Society, and as such has his obligations thereto. The advancement of science and the creation of material comforts are not the measure of fulfillment of his function or place in Society. He must play a role in directing mankind toward its ultimate destiny. The humanities of life touch every member of Society, and the knowledge obtained from contact with the rest of mankind clearly indicates, as does the absolute logic of reason, that concern must be given to the mortal coil known as the profession of engineering, if the soul or spirit of the calling is to survive.

Though nature be the field of the engineer's endeavors, mankind is the object of his efforts, and to go too far afield is dangerous. In order that the efforts of engineers may be regulated and led into proper channels, and that the preservation and development of Society, and not its destruction, shall be the ultimate end of these efforts, safeguards must be thrown around the practice of engineering and precautions taken to keep the calling which has done so much for humanity and which the future of Society seems predicated upon, from sinking to the level of a skilled craftsmanship. Such a development would compel engineering to reject the high destiny which all nature points to as the natural function of the profession which applies the great universal and immutable laws of nature for the convenience and welfare of mankind.

No profession or calling has a right to arrogate to itself a place of isolation or a plane of complacent satisfaction or superiority. All callings deal either directly or indirectly with human beings, and the accomplishments of a profession are merely one of the Divinity's ways for shaping humanity's course through this sea of universal destiny.

It is difficult to understand how a profession which has contributed generously to the welfare of mankind has so alienated itself from the influences of humanity as has engineering. To give its scientific accomplishments to the world is not the Alpha and Omega of a profession's purpose or scope. It is only through the reaction of humanity that a profession can function in that ennobling direction of exerting a refining, cultural influence upon mankind and herein the engineer has failed to develop the full potentialities of his calling.

Engineers have been inclined, as a whole, to separate themselves from the cultural world and to apply their thoughts intensely and rather exclusively to an application of the sciences and their laws to matter. This is wrong because the world needs the cultural influence that a profession can and should exert in order to appreciate the contributions of that profession to the welfare of mankind.

As in all instances of human endeavor pioneering is difficult and frequently misinterpreted effort. The accomplishment of the professional status of the engineer has been and still is the cause of controversy even amongst engineers themselves. The question of the sanctity of individual opinion and of unrestricted endeavor, so much identified with American pioneering, remains a paramount consideration to many. Unassailable as such policy may be in bucolic existence the urbanities of modern life make it difficult to deny, however much one may dislike legislative restriction, that regulation implies legal recognition and legal recognition is tantamount to establishment de facto. In this manner it is possible to eliminate something undesirable, viz., the person who is not an engineer, and at the same time achieve professional status in the eyes of the law. Thus there can be brought about by legislation in a comparatively short time that which could only be partially, if ever, accomplished by education of the public during which time engineering would encounter the risk of descending to the level of a skilled craftsmanship entirely outside the pale of a learned profession.

The policy of licensing or registering practitioners has been the accepted means of according a profession legal recognition for many years. While no one contends that such practice is an ideal, or even the only means, of designating a professional man, experience has shown that it is the only practicable one which has to date been attempted. There are many who believe that membership in a national society whose standards of admission predicate actual accomplishment is the best criterion. There are others who believe completion of a course in a recognized school should be the requirement. Neither of these is a practicable nor a proper standard. One is primarily a mark of the distinction, ability and success of an engineer, which is beyond the starting point of the actual career of a professional practitioner; furthermore such is the approval, not of a public agency but, as at present constituted, of various private groups no two of which have common standards and all of which include memberships of several grades including many who have no claim whatever to professional recognition. The other proposal merely signifies that a man has spent so many years in an institution of learning. Such a man may have learned little or he may have absolutely no originality and but little natural capacity. He may have missed the object of education which is to teach men to think for themselves. Merely absorbing facts, data and formulae, without understanding something of the reasoning behind them is of little value and may even be dangerous. Furthermore, such a criterion demands an absolute uniformity of education which is something unlikely of realization, until the standards of admission to practice and the examinations therefore make such uniformity a matter of expedience. Again, all men do not learn with equal facility. And finally, such a standard would be a selfish one that instead of protecting the public would merely create a caste to the exclusion of a Stevenson, a Faraday or a Leonardo DaVinci, whose benefits to mankind far exceed the combined contributions of a thousand scholastically trained mediocre engineers. Any method that predicates the elimination of a Shakespeare, a Burns, an Alexander Pope, a Spinoza, a Lincoln, an Herbert Spencer, a Bernard Shaw, a Steinmetz, a James Watt, a Franklin, a Sir Humphrey Davy, an Edison, the Wright Brothers and countless other self-taught men, would stifle progress and would not be in the interest of mankind.

The college has its place but after all it is a custodian and a disseminator and not the owner or discoverer of knowledge.

On the other hand, there frequently exists an equally intolerant attitude upon the part of self-taught men. In the past the national engineering societies have given but scant recognition or consideration to scholastic credentials, contending that the test of a man was his accomplishments. While this is undoubtedly true such a standard cannot be applied to a young man. Again, it is but a few years back that most professors were ineligible for full membership in certain societies. The writer has heard many eminent engineers in at least one of these societies state before audiences that the only school that should be recognized is the school of experience. This is a narrow and unwarranted attitude upon the part of certain engineers who seek to magnify themselves by manifesting contempt for persons trained in schools, certainly not the indicator of a big man.

The exponents of each of these systems of according professional recognition to the engineer has missed the real purpose and value of licensing which is the promotion of the public welfare.

The object of registration is not to create a class, confer a distinction, restrict individual opportunity, or deprive society of benefits of ability or genius. Its purposes is to protect life, health and property. It is primarily a measure of public safety. The State examines a man. It investigates his character and his knowledge. When it has done so it exercises the right to pronounce him either qualified or unqualified to protect the life, health and property of its citizens in practising a particular profession. In so doing it accepts a certain responsibility for the practice of the person and retains the right to revoke the certificate of qualification.

Under such conditions the State itself must make the most thorough investigation of all applicants. It cannot, except wherein the constitutional rights of an individual are jeopardized by depriving him of a privilege previously enjoyed without prejudice or calamity to the State, arbitrarily set up different standards for different persons.

Of all the requirements exacted of a professional man, by far the most important is character. Of what avail is knowledge or training if possessed by one morally unfit. The greater the knowledge the greater the menace to society in the case of a dishonest person. This requirement is a sine qua non of professional qualification. There can be no question as to the necessity for a complete investigation of character in the case of all applicants.

The qualifying examination likewise demands a thorough investigation of the ability of the candidate to expound and apply the principles and theories underlying the practice of the profession. In the light of certification it is the duty of the State to attest to this fact not by the acceptance of diplomas, testimonials or other credentials but by a thorough uniform written and oral examination of every candidate. This is the only means of establishing a definite minimum plane or standard for admission to practice. The all important question is not where or how acquired, but can a man demonstrate that he possesses the knowledge necessary to begin the practice of engineering.

Unfortunately there has been, in a few cases wherein license laws have recently been enacted, agitation from certain quarters to exempt graduates of certain schools, civil service employees and other certified persons from an examination of technical knowledge. Such an attitude places the public welfare second to personal interest. The writer has never heard any complaint from young graduates, the persons who have to submit to examination. The agitation generally comes from those who seemed swayed either by tradition or by a desire to enhance the importance of their momentary occupation. This will pass as has the sovereignty and infallibility of 20th century political economy. Whether a candidate comes from the regular army or national guard, an ordinary high school or a renowned university, he must pass an examination to enter the Military Academy. If one wishes to enter the Civil Service of most large cities or states he must pass a written examination regardless of credentials. If a person desires to practice law or medicine he must qualify through examination before a bar or medical examining board. Why, then, should engineers be so provincial and insist on ignoring recognized public policy. Why should any man be exempted from examination. If he has completed a systematic course that purports to cover the basic requirements why should he object to proving that he has actually acquired certain knowledge. He has a decided advantage over one who has not pursued a systematic course in a particular institution. The test of a man's ability is not in avoiding, but in meeting standards.

The standards should, in the writer's judgment, be very high but not provincial. They should be premised upon the needs of society and should be determined from the experiences of practising engineers of proven ability. They should be elastic enough to meet ever changing conditions and new problems.

The agency, which represents the State, should set the standards. The Board of Examiners should examine with a view to qualifying for practice. A review of texts or studies covered by curricula is not the purpose of an examination to qualify a person for professional practice. Schools should plan their courses so as to train students to meet the requirements of the Boards which are public agencies.

(To be continued in May issue)

ARMY WILL RE-BLAZE KEARNY'S TRAIL OF '46

Engineers to Follow Data in Diary of His Historic Trek to California

The War Department ordered army engineers today to re-blaze the route followed by General Stephen W. Kearney in 1846-47 on his historic march from Fort Leavenworth to help wrest California from the Mexicans.

Obscure documents of that trek, unearthed by Senator Hayden of Arizona, so interested General Malin Craig, chief of staff, that he directed the Eighth Corps Area commandant at Fort Sam Houston, Texas to send out a mapping party to chart Kearney's trail as nearly as possible from Santa Fe to San Diego and Los Angeles.

General Craig said the party, consisting of about fifteen engineers, would start its task this Summer.

But where Kearney and his advance guard of the "Army of the West" went by horse, muleback and on foot, the modern trail blazers will go by motor wherever possible, resorting to horses and pack animals only in the mountainous regions of Arizona.

"We are undertaking this task," General Craig said, "not only because it is important historically, but also because it fits in excellently with our idea of the proper training for topographical engineers."

The mapping party will start westward from Santa Fe, instead of from Fort Leavenworth because the trail between those points has been accurately posted already.

Permanent Values in Engineering Education

What Should be Taught at College

By GILBERT E. DOAN

Lehigh University, Bethlehem, Pennsylvania

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WHEN we, as an engineering society, ask an industrial leader as a guest speaker to tell us what he thinks we should teach in the field of engineering, we sit with attentive minds, eager to get a constructive suggestion from his talk. Then we are advised frequently to teach less of the engineering subjects to undergraduates, so the boys may not be deprived of their chance to get a liberal education. Naturally, we do not like such advice. If the oracle had asked for a course in the newest specialty of our field or even if he had merely asked for more effective teaching of the standard engineering subjects, we would be delighted to accept his suggestions, and be earnest in our efforts to profit by them.

But when he says, "You now teach too much engineering technology to undergraduates, it prevents them from developing broad foundations such as engineers need in the service of industry," then we console ourselves by thinking, "Of course the man doesn't really know what he is talking about. He has forged too far ahead in his own business to know what is actually going on in the engineering phases of his projects. If he realized what new developments there are in flotation, and prospecting, and grain size control, he would want all his young engineers trained in these fields before they leave college. So we shall just discount what he has said to us today, so vaguely and so pompously, about the value of the fundametals of science and the usefulness of the humanities in this grimly competitive life. We shall continue to teach just exactly we are teaching now, only more of it and by better methods."

That is what we have done. The S.P.E.E. study made in 1929 showed that in five schools considered as representative of the engineering institutions of the country, 55 to 60 per cent of the student's time was spent on technology; 30 to 35 per cent on fundamental science; 13 per cent on humanistic subject matter. There has been little change in these schools up to the beginning of the present academic year, when M.I.T. took a bold step to correct the lack of balance in the curriculum.

I have spent twenty years of my life studying engineering and practicing it in industry with some degree of satisfaction. I teach it, and research in it, not always without significant results. I write text-books about it. I am impressed with the high value of its contribution to the development of civilization. Like you, I have a vested interest in engineering from which I hope to continue to receive profits, and perhaps extra dividends. But I am here to warn all, that in spite of our loyalty to our chosen fields, if we are continuously unwilling to see technology in its proper relationship to the other essentials of undergraduate education, if we continue as we are now doing, to give too much technology and too little liberal education to engineering students, the investment of our lives will shrink visibly in value and in return. Either our engineering enrollment will drop in size and quality, or else some super-departmental power will arbitrarily reduce the amount of technology we are permitted to give our undergraduate students, thus putting us definitely out of our respected positions as educators and into the position of narrow technologists, if not teachers of vocations. I hope and believe we shall take the initiative into our own hands.

Very briefly now I give you my reasons for believing that engineering curricula must contain more of the permanent values of education than they now do. I shall not advance personal opinions, but rather shall attempt to sense and to reflect for you the convictions of the groups most vitally concerned in engineering education, first, the alumni, second, the industry that employs them, third, the leaders of engineering education, fourth, the leaders of general education, and finally, the national government.

First, and very briefly, let us look at the opinions of the recognized leaders of engineering education.

W. E. Wickenden, the director of that recent monumental survey of engineering education on two continents, pointed out [1] at its conclusion that but 19 hours of humanistic work was required on the average at the engineering schools which he considered representative: M.I.T., Cornell, Penn State, Purdue, and Wisconsin. In 144 hours total, this is 13 per cent. Wickenden suggested raising it to 17 percent by running an integrated band "of three hours of humanistic courses throughout the entire four years." This suggestion was made prior to the social and economic crisis of 1929-32. Today Wickenden appears as a prophet among us.

Dr. Karl Compton, President of M.I.T., says, "I believe that our criteria for real engineering schools should include the best possible basic training in the sciences and fundamental engineering subjects, with some specialization, and with very considerable attention to the place and the problems of the engineer in society".[2] And he meant it, because M.I.T. this year adopted the Wickenden suggestion.

In 1934 Dean of Engineering Doherty of Yale writes, "It seems to me that these S.P.E.E. recommendations are sound, as far as they go, and also that it is quite possible that a more active and general recognition of them might have placed engineering education in a more appropriate position than it now occupies." And later he amplified his meaning, as follows: "The educational importance of lifting the incubus of specialized undergraduate courses cannot be over-emphasized." Dr. Doherty is a man with an excellent professional experience with the Steinmetz

(1 Jour. Eng. Ed., Vol. 17, 1926-27, p. 797).
(2 Jour. of Engrg. Ed., Vol. XXIII, No. 2, Oct. 1932, p. 75).

Editor's Note: We recommend you send a copy of this article to your own college President and each of the Board of Directors—we are doing just that—what would you have your Son learn at college.

group in Industry, and is now President of Carnegie Tech. "One of the greatest deficiencies of engineering courses in this country, in my opinion," he continues, "has been the lack of cultural balance. Where such a balance has not existed, the student's intellect has been literally starved for the vitamins of human appreciation, thus leaving him with what might be called technical rickets—a wooden interest in matters outside his technical field."[1]

These opinions indicate a truly remarkable unanimity and depth of conviction among the recognized leaders of engineering education. They are not snap decisions but dating as they do from 1927 to 1937, they bridge the greatest social and economic upheaval of our times.

Now let us glance at the opinions of the country's industrial leaders. Perhaps the leaders of engineering education have somewhere gone astray. Perhaps, contrary to the opinions of the leaders of engineering education, what Industry really wants is a maximum of technical training in our graduates, whether they are soundly educated or not.

To find out what the top executive at General Motors thought about it, Mr. Glancy, a Vice-President, made a careful canvass. His report says, "To a man the motor executive did not see the need of a boy's specializing, not even in gasoline engine design—not because his designs would be obsolete by the time he graduates, but because our greater need is for a complete grounding in the fundamentals."

Mr. Carrier, President of the air conditioning company of that name, answered a Lehigh student's inquiry recently by saying, "By no means should you study air conditioning at Lehigh if you intend to enter that field on graduation, but rather you should study the fundamentals on which air conditioning is based."

Mr. Sloan, Chairman of the Board of the Missouri, Kansas and Texas Railroad, is even more emphatic. He says, "Many technical graduates are the victims of an over-intensified technical training which drove out of them, or failed to develop in them, other elements essential to a proper use of technical education, essential to continued and progressive usefulness in an organization where technical men are only a part of the whole. Industry wants men with a background and education broad enough so that technical training assumes its proper place but does not become the whole." Mr. Sloan was formerly President of the Brooklyn Edison Company.

I could add to this list, as you could, with the names of General R. I. Rees, Willis R. Whitney, and many more, all with this conviction deep-seated in their minds as a result of their own experience in Industry.

Even when a successful specialist is invited by his alma mater to come back to the campus and tell the undergraduates how to build a successful career, does he say, "Get all the technical specialties you can while at college?" Or does he put the force of his entire personality into his emphasis upon the need for men with a grasp of the fundamentals of science and the humanities. Does he say, "Specialize at college," or does he say, "Get the permanent values at college and specialize *after* college?"

The next group, the scholars and educational leaders, we can pass with hardly a word. Jessup, Head of the Carnegie Foundation for the Advancement of Teaching, Flexner of the Institute for Advanced Study, Hutchins of Chicago, the Lowell Medical Commission, all speak with a single voice in earnest petition for delayed specialization, for a solid foundation of the permanent values first.

What do the alumni of our engineering colleges say about the curriculum in which they spent four years? If you will ask them occasionally, assuring them first that you are able to look objectively at the importance of your own specialty, you can easily find their true opinion. They will tell you that after they have had one or two promotions, they find three-fourths of their problems and responsibilities are humanistic-non-technical. If this is true, can a boy afford to spend a large part of his four years at college preparing for the first five years in his profession? Or should a college education lay a foundation that will last a lifetime? The really successful engineers look back with regret at much of their specialization at college and at their lack of liberal education with which to meet their principal problems. Even in research and design the chances are that the so-called practical courses in technology are of relatively little use compared with the fundamental courses in physics and chemistry. And we must not forget either that, according to President Compton, less than 50 per cent of our engineering graduates follow engineering as a life work. Should the other 50 per cent too be deprived of a chance at the permanent values in education?

Finally, as many of you are aware, the President of the United States upon the advice of a group of his engineering advisers, in the recent vast conservation projects of national scope, is led to question in his letter to 100 presidents of institutions teaching engineering "whether the curricula of engineering schools are so balanced as to give coming generations of engineers the vision and flexible technical capacity necessary to meet the full range of engineering responsibility." This is the question we are met to consider. I will leave it with you to answer. Greater unanimity of opinion among the diverse groups concerned could scarcely be found on any question of urgent public importance. You have noted that it is not specialization that they object to but only *premature* specialization, accompanied by lack of grounding in the humanities. Perhaps it is true that the high schools should give this grounding as they do in Europe. But what we face as engineering educators, is a concrete situation, not a hypothetical one. This situation calls for a concrete solution and an actual decision as to what the boys need most who come to us here and now.

If the leaders of engineering education on the one hand, and the leaders of Industry on the other hand, the highly successful professional engineers, and the national government all petition for greater humanistic content and less special technology in undergradute engineering education, how can they possibly be denied, you ask me? The answer I give you is a factual one. Those responsible for engineering curricula find that the majority of their students are sent to college by their parents for the purpose of learning a special skill, if not a vocation. The great majority of these parents have never been to college themselves and have little or no background of judgment in planning their son's education. They have seen many successful specialists in their lifetime and they want their sons to specialize. So they send him to a college that teaches plenty of specialties to undergraduates. Once at college, the aspiring boy meets an enthusiastic specialty teacher and almost at once becomes motivated by a zeal to master a restricted field and make his name and for-

([1] Jour. Eng. Ed., Sept., 1934, p. 35).

(Continued on page 24)

The American Airship and the American Professional Engineer

***Remarks of* Hon. JOHN M. O'CONNELL of Rhode Island**

in the House of Representatives, Monday, June 1, 1936

Following is the copy ot a speech delivered on the floor of the House, reprinted from the *Congressional Record,* in view ot the tremendous arms program which Great Britain deems necessary to adopt for its defense.

Great dirigible airships, filled with non-explosive helium gas, armed with long-range rapid fire guns covering every point of approach to the airship and each airship transporting ten or twenty military airplanes should be a most effective means for the defense of our country.

The construction of a fleet of such airships may result from the approval, by Congress, of Bill H. R. 2252, these airships being constructed primarily for extending our foreign overseas trade but may be converted to military use, as described in Bill H. R. 2253.

The importance of these Bills is shown by articles in leading newspapers, reference in radio news, and expressions of indorsement by leading American engineers. Your cooperation in securing the approval of these Bills will be appreciated.

Sincerely yours,

JOHN M. O'CONNELL

MR. O'CONNELL. Mr. Speaker, in the preparation of several articles published in the *Congressional Record,* I have compiled valuable data which should be printed as a reference for those who may consider the design, construction, and operation of American airships.

When I speak of American airships, I refer to those which shall be designed and constructed by American engineers, upon American engineering principles and not to airships constructed, with Government funds, upon German Zeppelin principles or airships built in Germany.

It is not my thought to censure the great work or the accomplishments of the German Zeppelin organization, which for 30 years have concentrated its efforts upon improving airship design, construction, and operations. They have demonstrated the fact that large airships are practical and useful, as a means of air transportation. Improvement as the result of their effort cannot decrease the honor of originating the airship and history shall record the distinction due them for their work.

That such distinction is already conceded is shown by the fact the name "Zeppelin" enjoys such present popularity and is so strongly associated with airship construction in the minds of people that, not alone in Germany, it is thought the type of structure employed in the Zeppelin is the only one that will do for an airship.

As to the construction used in the Zeppelin, the criticism is often heard, even in authoritative German quarters, that it is not the most satisfactory solution and that it becomes less so with increase in size of the airship. The structure is an adaptation of the arch-frame bridge and is indeterminate, therefore cannot be calculated upon normal engineering formulae and is "estimated" upon an empirical formulae.

In my remarks in the *Congressional Record,* April 14, 1936, I said:

It is interesting to know that the empirical formulae is established only through experience of actual construction and use of what is classed as an indeterminate structure.

Prior to the construction of the *Akron* and *Macon,* the Zeppelin engineering organization was supplied with data for an airship as large as the *Los Angeles* or the *Graf Zeppelin.* They may have desired to construct an airship the size of the new *Hindenburg,* but perhaps had no data to then warrant such construction. What would they do about it?

It has been stated that when Germany believed it would win the war the German Imperial Command considered who would pay Germany. Their opponents were without resources to pay, and if the United States could be forced into war against Germany then the United States could pay Germany, for the United States was a wealthy Nation. The German Imperial Command, therefore, is said to have deliberately ordered certain naval operations which resulted in the United States becoming involved.

If the German Zeppelin engineers wanted definite information that would warrant them to build the *Hindenburg,* which is larger than the *Akron* and *Macon,* and to advance their empirical formula with construction and operations data they would need to build larger airships or get someone else to pay for the experiment. My opinion is the United States was again chosen to be "the goat." The construction and destruction of the *Akron* and *Macon* undoubtedly supplied valuable data to the German Zeppelin organization for the construction of the *Hindenburg.*

I do not wish to say anything detrimental to our now-valued American citizens of German birth, who may formerly have been Zeppelin-trained engineers and came to our country to aid in the design and construction of the *Akron.*

The fact remains, however, that these engineers perhaps had not acquired the full technical knowledge then possessed by the Zeppelin organization, or, if they had such knowledge, they did not insist that the *Akron* and *Macon* be constructed with certain important reinforcements which I am informed were employed in the construction of previous Zeppelin airships.

I understand that during the Lighter-than-Air Forum, at Akron, Ohio, July 25 and 26 last year, the Navy Department was charged with responsibility for the loss of the *Akron* and *Macon* because the builders were not allowed to include certain reinforcements which had been considered necessary and were included in previous Zeppelin-constructed airships.

I do not know if an investigation has been made concerning these charges or the result of such investigation, if made.

The loss of the *Akron* and *Macon* is thought to be directly the result of structural failure at a place which in other Zeppelin airships was reinforced, and the operating personnel of these airships were no more to blame than

a driver of a new automobile should be blamed when a front axle breaks and the automobile is wrecked.

We should at least learn from the loss of $10,000,000 worth of airships, with the lives of scores of men, that we should now question the advice of those who may be responsible for the structure failure of the *Akron* and *Macon* and of those who now recommend the continued construction of such airships, when the United States has the most competent structural engineers in the world, who have been ignored when American airship construction has heretofore been considered.

Extending this thought further, I am informed that when the *Hindenburg* arrived, upon its first trip to the United States, an article was printed in a New York paper stating one of the officials of the Zeppelin organization explained the use of hydrogen gas, when it had been understood the *Hindenburg* would receive helium gas in America, by the fact the difference of 8 pounds lift per thousand cubic feet in the two gases required they build the *Hindenburg* lighter, like the *Akron* and *Macon,* or build it stronger and heavier.

The *Hindenburg* employes 7,000,000 cubic feet of hydrogen gas, thus will lift 56,000 pounds more than were helium used. An article in the press stated the payload of the *Hindenburg* was 28,000 pounds. Thus with helium gas there might be no pay load, in fact the airship might be 28,000 pounds heavier than the helium gas would lift.

In my letter of February 10, to Members of Congress, I referred to an article published in the *New York Times* January 19, 1936, detailing "modifications" in the original *Hindenburg* design. These modifications appeared to be of a character disclosed by the report on the Respess design, issued December 28, 1933. An American design that may comprise features of sufficient value to perhaps modify the Zeppelin design, in the construction of the latest German airship, should be valuable in considering American airship construction.

The fact that the United States has a generous supply of helium gas, while other nations have none, and that this nonexplosive gas increases the safety of airships, both in commercial and military service, should influence the United States to build and operate airships for extending our foreign trade and for the defense of our Nation in the event of war.

In order to use this gas, an airship must be strong to resist stresses and provide safe operations, also be much lighter in weight than appears is possible to be when the Zeppelin construction is employed, as in the *Hindenburg.*

These factors of necessary strength for safety and of light weight to use helium gas for increased safety, must necessarily call for a new type of airship frame, especially in view of the fact that even in authoritive German quarters it is recognized that the Zeppelin adaptation of the arch frame is not the most satisfactory solution and it becomes less so with the increase in size of the airship.

The problem is one to be solved by professional structural engineers, of which America has the best in the world.

The selection of the best materials with consideration of their strength-weight factors, creating a design for using these materials in the most efficient manner, removing the possibility of reversal of stress and fatigue which may secretly affect the strength of materials and reduce the life of a structure, distributing the aerodynamic and static loads to avoid localized stresses, all require the ingenuity and experience of the best qualified professional engineers.

These factors have been studied for several years by eminent American engineers, and an improved design for large airship frames has been prepared for the construction of American airships. This design will meet the above specifications with use of the highest grade steel-wire bridge cables for tension and the best aluminum alloy for compression.

Reversal of stress is not possible in this design and aerodynamic or load stresses are received on elastic steel cables in a manner to aborb the stress by "extension" to adjacent elastic members.

The safety factor of this frame is high; it is light in weight; it will provide a long period of useful service, has relatively few parts, and the cost of its construction is low.

I have been very much impressed by the Vow of Service prepared by Dr. D. B. Steinman, president of the National Society of Professional Engineers, published in the February issue of the AMERICAN ENGINEER, as follows:

The engineer—he is the master of the laws of Nature. On a sound foundation of mathematics, science, and economics he bends the materials and forces of Nature to his plan and rears the structure of civilization.

With vision, resourcefulness, and ingenuity, he labors to increase the comfort, wealth, and safety of his fellow men.

He attacks his problems with the vision of the pioneer, the integrity of the scientist, the accuracy of the mathematician, the practicality of the businessman, the resourcefulness of the inventor, and the courage of the conqueror.

He is the planner and builder. He builds his visions into enduring realities.

He is the pathfinder of civilization. He breaks down barriers, bridges chasms, establishes communication, and straightens the way for commerce and human progress.

He is the protagonist of efficiency. He reduces effort, eliminates waste, and increases production.

He is the creator of a nation's wealth. He drains the swamps, reclaims the deserts, develops resources and harnesses power. He builds the machinery of industry, the wheels of commerce, and the structure of business.

He is the great coordinator. He plans and directs the construction of projects representing the investment of millions of dollars and involving the labor of thousands of men.

He investigates with open mind and gets the facts before he makes decisions. He plans with thoroughness and builds with fidelity.

To his rich heritage from the labors of past generations of engineers and scientists he adds his contributions. He continues the work of forcing outward the challenging barriers that separate man's efforts from the impossible.

Dr. Steinman is an eminent consulting engineer in the design and construction of both arch-frame and suspension bridges and is recognized throughout the world as among the leaders in his profession. He has designed many of the great bridges in North and South America, as well as other sections of the world.

He has knowledge and experience that assures his ability to analyze the Zeppelin arch-bridge type frame, the aerodynamic and load stresses imposed on an airship in flight, and to design an airship structure with the application of the suspension-bridge engineering principles for any size airships.

[Copy of citation in Who's Who in America, 1932-33]

Steinman, David Barnard, bridge engr.; b. N. Y. City, June 11, 1886; s. Louis Kelvin and Eva (Scollard) S.; B. S., summa cum laude, Coll. City of New York, 1906 (3 yrs. fellowship in mechanics); C. E. School of Mines, Columbia, 1909 (2 yrs. scholarship in applied science);

A. M. Columbia, 1909; Ph D., 1910; 1 yr. scholarship in engineering; m. Irene Hoffman, of New York, June 19, 1915; children: John Francis, Alberta, David. Engineering work until 1910; professor of civil engineering, Univ. of Idaho, 1910-14; also consulting practice; special assistant to Gustav Lindenthal on design and construction Hellgate Arch Bridge and other notable bridges, 1914-17. Prof. in charge civil and mech. engrg. College of City of N. Y., 1917-20; cons. practice since 1920.

Designing or cons. engr. many notable bridges, including suspension bridge at Florianopolis, Brazil, largest bridge in S. A., 1922-26; Carquinez Strait Bridge, Calif., longest Cantilever bridge in U. S., 1923-27; Gen. U. S. Grant Bridge over Ohio River at Portsmouth, Ohio, 1926-27; bridge at Grand Mere, Que., largest suspension bridge in Canada, 1928-29; St. Johns Bridge, Portland, Ore., longest and highest span in the West, 1929-31; Sidney Harbor Bridge, Australia, Cologne Muhlheim Bridge over the Rhine, Germany, Sparrows Point Bridge, Baltimore, Md., and many others in five continents. Inventor of new influence line method and charts for design of railway bridges; improvements in suspension bridge design, new system of design loading for railway bridges, simplified methods of analysis for bridge design. Lecturer on bridge design at univs. and engrg. schools. Fellow Aerial League, America, American Geog. Soc. Mem. Am. Soc. C. E., chmn. Structural div., 1931-33; Am. Assn. of Engrs., pres. 1925-26, New York; State Soc. Prof. Engrs., pres., 1930-32; N. Y. State Bd. of Licensing for Prof., Engrs., and Land Surveyors, vice-chmn. 1931-32; national counsel State Bds. of Examin. Engrs., pres. 1931-32. Am. Engrg. Council Com. on Bridge Legislation, 1930-32. Brooklyn Engrs. Club pres. 1931-32. Am. Ry. Engrg. Assn., Am. Soc. for Testing Materials, Am. Concrete Inst., Am. Military Engineers, Soc. for Promotion of Engineering Edn., A. A. A. S., assoc. alumni council city of New York, Engrg. Inst. of Canada, Internat. Assn. Bridge and Structural Engineers. Phi Beta Kappa, etc. Awarded James R. Crowes Medal, 1919. Normal Medal, 1923. Thomas Fitch Roland Prize, 1929. All by the Am. Soc. C. E. Artistic Bridge Award, Am. Inst. Steel Construction, 1930. Prize American Assn. of Engrs., 1926, for "Vow of Service" adopted by engineering profession.

Clubs: Columbia Univ., Millions Club of Sidney, Australia (hon.); author "Suspension Bridges, Their Design, Construction, and Erection," 1923. "Suspension Bridges and Cantilevers, Their Economic Proportions and Limiting Spans," 1911. "Theory of Arches and Suspension Bridges from Melan," 1913. "Concrete Arches, Plain and Reinforced, from Melan," 1917. "Continuous Bridges in Movable and Long Span Steel Bridges," 1923. "Suspension Bridges in Movable and Long Span Steel Bridges," 1923 "Stress Measurements on the Hell Gate Arch Bridge with Appendix on Secondary Stresses in Hell Gate Arch," 1918. "Locomotive Loadings for Railway Bridges," 1922. "Moments in Restrain and Continuous Beams by the Method of Conjugated Points," 1926. "The Eye-Bar Cable Suspension Bridge at Florianopolis, Brazil," 1927. Also numerous articles and papers in engineering journals. Editor, Engrs. Handbook Library, 1921-23. Home: 305 Riverside Drive. Office: 117 Liberty St., New York, N. Y.

I am informed that Dr. Steinman was consultant on the construction of the George Washington Bridge crossing the Hudson River at New York, is consultant on the design of the Tri-Borough Bridge now under construction at New York, is consultant on the construction of the Golden Gate Bridge at San Francisco, as well as for several other large American bridges completed during the past few years.

One of our American inventors developed the idea of employing the self-anchored suspension bridge principle in the construction of airships. With the cooperation and advice of the Guggenheim School of Aeronatuics of New York University, following standard procedure, a scale model was made and tested with very satisfactory results. Robinson & Steinman, consulting engineers, were then employed to design a suspension-bridge frame for an airship, to be constructed upon specifications prepared by the Bureau of Aeronautics of the Navy Department, for the *Akron* and *Macon*.

Upon the completion of this work Messrs. Robinson & Steinman submitted a report in which were the following statements:

Whatever may be said of the performance of the Zeppelin airship will apply equally to the Respess airship, but the Respess airship would have in addition the following advantages:

Greater strength and safety.
Greater inherent strength.
Increased length of life.
Decreased maintenance costs.
More efficient use of material.
Reduction in cost of construction.
Reduction in time of construction.
Ease of construction.
Simplicity, accuracy, and definiteness of calculation.

The stresses in this airship never reverse, thereby removing all fear of failure in the hull through fatigue and crystalization.

The net pay load will be unusually high, facilitating economical commercial operation.

It should be explained that the design referred to was for an airship 147 feet in diameter by 785 feet long. In view of the fact the frame was the chief consideration, Robinson & Steinman was supplied with complete plans prepared by British airship engineers with the cooperation of an eminent American consulting engineer, which plans were made for submitting a bid for the construction of the two naval airships, later named the *Akron* and the *Macon,* but owing to a technicality the bid was not considered in awarding the contract.

It should be noted Robinson & Steinman not only had knowledge of the construction of the Zeppelin-frame airships but were also fully advised on the details of British airship construction. Thus their conclusions of "greater strength and safety" with other enumerated advantages was for the American design as against the best production of other nations which had designed, constructed, and successfully operated large airships.

We do not, however, have to accept the judgment of only one organization of eminent American engineers. During the present session of Congress I have received letters from engineering societies and professional engineers from nearly all States endorsing the structural principles of the American design endorsing the report and conclusions of Robinson & Steinman, or deploring the fact our Government has neglected the American engineers who are competent to design and construct American airships.

Connecticut Society of Professional Engineers—Respess Airship, May 30, 1936

At a joint meeting last night of the executive board of the Connecticut Society of Professional Engineers with the legislative committee of the society, a detailed report

was received from the subcommittee that was appointed at the last meeting of the board of directors to study the relative values of the American designed suspension-bridge-frame airship and the conventional type airship designs. At the committee's request, designs, data, computations and structural details, with a report from Robinson and Steinman, bridge engineers, on the Respess airship was submitted to it. After 2 weeks of independent study, the committee members joined unanimously in their report which was substantially as follows:

The Respess airship design of suspension-bridge type has structural merit over the conventional type of airship because of these evident advantages:

1. Inherently greater strength with less material.
2. Lower cost of building per cubic foot.
3. Greater factor of safety in storms, at anchor, and in maneuvering.
4. Greater pay load.
5. Bow and stern of greater strength.

Representatives from practically all branches of professional engineering, aeronautical, Diesel, structural, electric, mechanical, power plant, civil, metallurgical, were involved in the study, report, and recommendations.

I stand on record as endorsing the American professional engineer as one class of our citizens who merit real consideration in periods of depression and in matters so closely akin to national defense as is the American airship. After all, it is from their initiative and development in new fields of science that employment eventually emanates.

Government appropriations or loans could well be directed into channels that would increase their employment, as in American airship design and construction or other new types of industries, for which no provision for Government aid, in financing, has been made. Failing action by the present Congress, relief funds could be directed into these channels as loans for providing immediate employment and to be repaid over a period of years to the Treasury general funds.

A notable endorsement of the American engineer, for constructing American airships, comes from Dr. Theodor Von Karman, a former leading German lighter-than-aircraft authority, now an American citizen, who is recognized as being a valuable aid in American heavier-than-aircraft development, through his outstanding ability in stress anlysis. The Oakland (Calif.) Tribune published the following:

Expert Urges United States to Push on with Dirigibles—America Should Not Leave This Construction to Germans, Says Von Karman

PASADENA, March 15.—America should not "leave dirigible construction to the Germans," in the opinion of Dr. Theodor Von Karman, member of the "scientific jury" appointed to decide this country's airship future, and himself a former leading German lighter-than-air-craft authority.

Dr. Von Karman, director of the Guggenheim Graduate School of Aeronautics of the California Institute of Technology, urged that the United States push ahead in commercial airship construction for, he said, trans-Atlantic air service will be accomplished only by dirigibles.

Reticent regarding the course the Navy should take, in the light of the *Macon* and *Akron* disasters, he said: "It appears to me that possibly the technical problems should be cleared up before dirigibles are made a part of routine military work.

Dr. Von Karman, who was director of the German Aeronautical Institute at Aachen before coming to the United States, praised American aircraft builders' skill and said American ships had been subjected to unfair comparisons with German aircraft.

"It is not quite fair," he said, "to compare the Navy's record of three military airship disasters with the successful record of the *Graf Zeppelin,* a commercial transport. Military aircraft present greater problems, both because of their construction and the use." He pointed out that Germany lost more than 50 zeppelins during the World War through enemy bullets and disasters such as those that overtook the *Macon* and *Akron.*

Airplanes will be used for transoceanic-mail service, but not extensively for passengers and freight, Dr. Von Karman predicted.

Opposed to the employment of the American engineer in American design and construction, we have the "Zeppelin" name, coupled with a most efficient organization, that may have been influential in discouraging the consideration of any United States dirigible construction upon American design. This influence is still endeavoring to have us buy airships built in Germany or to build airships of German design in the United States. I may best illustrate this fact by referring to my remarks in the *Congressional Record,* May 14, 1936, as follows:

It is not my purpose to make any statement that may reflect on the German engineers who constructed the *Hindenburg* or of those in charge of the airship during its successful flight, but as an American citizen and Member of Congress, I feel it my duty to comment on certain statements published in the press.

The Sunday Star, Washington, D. C., May 10, states:

Eckener reveals purpose of trips. United States financial backing is sought. Dr. Hugo Eckener, commodore of the Zeppelin fleet, said in an interview tonight the primary purpose of the *Hindenburg's* cruises to the United States this year was to win financial backing for a German-American trans-Atlantic transport service.

Such an arrangement between the two countries was planned in 1928, he pointed out, but was frustrated by the depression.

Loss of the Navy dirigibles *Macon* and *Akron* has since soured the American public against dirigibles, he said, and lighter-than-air enthusiasts hope to remove that feeling by week-to-week demonstrations of the *Hindenburg's* capabilities.

It is of interest to know where this financial backing is expected to come from. I have a letter signed by a vice-president of the Goodyear Tire & Rubber Co., dated April 28, 1936, stating the following:

We are interested in the subject of airships but are not presently considering the erection of a ship. This has to go through the process of authorization by Congress.

The Washington Herald, Sunday, May 10, states:

United States dirigible sought to match *Hindenburg.* Naval experts' hopes rise as officials prepare to greet Eckener. Successful trans-Atlantic flight of the German Zeppelin *Hindenburg* yesterday buoyed hopes of naval and congressional lighter-than-air enthusiasts that the Federal Government would sponsor constructing a twin ship, perhaps to complement the German air liner's North Atlantic schedule.

Senator Bulkley, Democrat, of Ohio, has introduced a bill authorizing Federal construction of such a ship.

Navy experts have already planned for construction of a giant sky cruiser exceeding the *Hindenburg* dimensions, to replace the U. S. S. *Akron,* lost at sea 2 years ago.

The Navy's scientific advisory committee, following investigation of the *Akron* and *Macon* disasters, in a preliminary report has recommended continuance of the Navy

(Continued on page 24)

Open Forum

EDITOR'S NOTE: *The following bulletin of "The Engineers Association" of Dublin, Ireland was sent to our Dr. Steinman in an exchange of correspondence.*

OUR IRISH FELLOW ENGINEERS

(The Engineers' Association)
23, Grafton Street,
Dublin,
5th March, 1937.

PRESIDENT

Professor Felix E. W. Hackett, M. A., M. Sc., Ph. D.

VICE-PRESIDENT

R. G. Allen, B. Sc., M. I. E. E., A. R. C. Sc. I.

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P. McDonald, B. E., A. R. C. Sc. I.
C. N. McLeod, B. E., A. M. Inst., C. E. I.
J. O'Dea, M. E.
J. Pelly, B. E.
A. W. M. Ternan, B. A., B. A. I., L. R. I. B. A.

Dear Sir,

The Engineers' Association addresses itself to all qualified Members of the Engineering Profession in Ireland, i. e. to all holding a recognised engineering degree or its equivalent.

The objects of the Association are to improve and advance the status and remuneration of the members of the Profession.

The Council considers the most effective way of achieving these objects is to concentrate mainly on the following programme:

(a) Recognition of the Association both within and without the Profession;

(b) Recognition of the high standard of training and ability of Irish Engineers;

(c) Legal recognition, i. e. Registration.

The attainment of these aims means the establishment of the engineer as a professional man, with obligations to colleagues and to public alike.

The Association regards Engineering as one great Profession in which qualified Civil, Electrical and Mechanical Engineers are all included,

This letter is addressed to all those qualified Engineers who are proud of their Profession and of its great tradition of service to the community, and who are concerned in its future—not in any narrow or selfish way —but in the broad Professional sense. Individual Engineers and groups of Engineers are, however, not by any means overlooked as is evident from the recent actions of the Association in connection with the Sugar Company; the Turf Development Board; salaries and conditions offered by local authorities, etc.

While it can justly be claimed that since its formation some years ago the Association has made great progress, it must not be forgotten that although the energy and industry of the Council may accomplish much, the backing and support of the Profession as a whole is essential in order that the Association may take its rightful place as the organization dealing with all questions affecting the status and employment of Engineers as distinct from academic matters.

The President of the Association, Professor Hackett, in a paper, "The Engineering Triad; Craftsmanship; Technology; Science" read in Dublin in February, 1936, drew attention to the comments of the well known publicist Professor H. J. Laski on his experience in interviewing Engineers for an appointment in a London power station. "I could not help feeling," he writes, "that most of these men had no real sense of how to organize and protect their interests. If I were one of these men, I should feel that it was a moral obligation to organise my colleagues into something like an effective professional association. I doubt whether most of them understand even remotely the situation in which they are involved. Politically and economically, they are fast asleep."

Should any engineer, or group of engineers be interested in the aims and objects of the Association, the Council is desirous of arranging a meeting in any centre, where a number of Engineers can co-operate, as it is the intention of the Council to set up regional Committees.

Yours faithfully,
CHARLES J. HOLOHAN,
Secretary.

CONNECTICUT SOCIETY OF PROFESSIONAL ENGINEERS

The receipts of your kind invitation to join the Conn. Society of P.E. yesterday gives me an opportunity to express my views, as an outsider, of this organization. First I am 100% in favor of the Registration of Engineers and will work toward making our laws stronger.

However, I am not in accord with the State and National Society of Professional Engineers as it is now set up. I have nothing but a high opinion of the state and national officers who have pioneered the whole field for the Engineer. I am looking toward the future and I can see no future with the present financial and organization set up.

THE AMERICAN ENGINEER for which $1.00 per year is charged is, at present, no value to an engineer. Its articles dwell on a strong national Society and continually print the same articles, each time set up or written differently. These articles are usually hobbies of the officers. We pay in addition to the above dollar an additional $3.00 to pay the cost of the National office.

I understand the remaining $7.00 in dues stays in Connecticut with $0.50 returned to the local society. I know that you and others contribute a large amount each month in addition to the dues collected.

We know that no local society in Connecticut is active unless it be the Bridgeport Chapter which is supported by the State Society. How can they be on $.50 per year? Can the money spent by the State Chapter be justified—by the National Society?

It seems to me that to reach the goal set in your flyer, the local society must be built up such an extent that the State Society will be needed only to organize new groups and coordinate the existing ones. The National Society should exist and the paper should be published although much improved.

I believe this whole program could be financed for $6.00 per year divided as follows: $2.00 for local group, $1.00 for State and $3.00 for National Societies. The magazine should be expanded and made self supporting through advertisements—i e., have McCraw Hill, or its like, publish it.

I believe that with a strong local society that the membership will increase not only in Connecticut but in the other states as well. I recall seeing published somewhere, the number of engineers supporting the State and National Societies, which makes me believe that the change in dues and policy would increase the membership and thereby not reduce the present income.

The future of the Society, it appears to me, rests with the young engineers who at this stage are not able to spend $11.00 out of their small income to support something which offers them no immediate value and questionable future value.

Yours very truly,
(Signed) ROBERT F. BURNHAM

Dear Engineer Craig:

I wish to express my hearty approval of your appointment by the National Officers to serve as Chairman of the Publication Committee and Editor of THE AMERICAN ENGINEER, and to voice my appreciation of the immediate improvement in appearance and general make-up of the publication. It is my sincere hope that as the circulation increases and as more funds become available, THE AMERICAN ENGINEER will rapidly become a publication of which we may be justly proud, —a completely worthy exponent and expression of our aims and ideals through which the public will increasingly learn of our activities and objectives.

To serve the latter purpose effectively, the magazine must have as wide a distribution as possible. I suggest that the librarians of Colleges, Universities, Technical Schools and Public Libraries be contacted in an effort to obtain subscriptions from all such institutions. It occurs to me, also, that many young engineers who may not yet be ready or qualified to register and registered engineers not members of the National Society, as well as engineers in States which at present have no registration laws, would welcome an opportunity to subscribe to our official publication in order to become informed concerning our functions and activities. This would encourage registration and affiliation with our Society. As funds permit, the entire membership of the founder Societies should be canvassed. I believe the cost of such an undertaking would be more than offset by the value of the subscriptions received. The indirect benefits would be immeasurable.

There is one comment I would like to make concerning the content of the magazine. It has seemed strange to me that no

information is published concerning the number of members in the various State Societies and in the National Society. One of the best means of stimulating membership in our Society would be by creating a rivalry between the various State Societies and between the various Chapters within the State Societies concerning the acquisition of new members. This rivalry could be fostered by the publication of the membership figures. I should like to see the membership figures for each State organization and the total for the National Society given in each issue. In addition, a graph of membership growth, corrected monthly if possible, should be shown. Then we could all get busy to push the curve upward. I feel certain that this would stimulate membership growth. Publicise the figures and every member would go to work to better them.

With best wishes for your policy of continued improvement, I am

Cordially yours,

WM. S. LOHR, *Vice-President,*
Pennsylvania Society of Professional Engineers.

Dear Editor:

Re Illinois Registration Law

I am a Registered Professional Engineer in Connecticut and Wisconsin, and a Registered Land Surveyor in Florida.

Keenly interested in the proposed Law governing the practice of engineering in Illinois, I have endeavored by telegram and letter to bring out the weakness of that law but my voice is "of one crying in the wilderness."

As a member of the National Society of Professional Engineers I respectfully submit a copy of the enclosed letter to "THE ILLINOIS ENGINEER," with a request that same be published in "THE AMERICAN ENGINEER" if such publication is not contrary to policy.

It is the writer's contention that a Law which permits an engineering firm to send out on construction, unlicensed men, is worse than no law at all and defeats the purposes for which we of the N.S.P.E. organized.

Yours very truly,

William Stack,
Registered Professional Engineer.

The Editor,
The Illinois Engineer,
Urbana, Illinois.
Dear Sir:

Registration

This year engineers in Illinois have become License-conscious to a degree of enthusiasm never known before. But in our eagerness to accomplish our desired ends let us consider a specific feature of the present bill before the Legislature. Furthermore, let us approach the question from the point of view, not of the Consultant but of the rank and file of the engineering profession. For a proper consideration of the proposition let us for a moment inquire into the operation of the Registration Law of our sister state, Wisconsin.

The Wisconsin Registration Law as amended August 1, 1935 reads in part, "The practice of professional engineering within the meaning and intent of this section includes any professional service, requiring the application of engineering principles and data, wherein the public welfare or the safeguarding of life, health or property is concerned and involved, such as consultation, investigation, evaluation, planning, design, or *responsible supervision of construction,* alteration, or operation, in connection with any public or private utilities, structures, bridges or industrial plants, buildings, machines, equipment, processes, works, and the structural members of other than industrial buildings."

Exempt persons under the Wisconsin Law include "An employe of a person holding a certificate of registration in this state who is engaged in the practice of the profession of architecture or of professional engineering and an employe of a person temporarily exempted from registration; *provided, such practice does not include responsible charge of architecture or professional engineering practice* as defined in this section."

As that law now stands, it would be quite possible for a chiselling engineering firm to send out on a construction job an immature and inexperienced engineer, paying him a fraction of the salary it would have to pay a more experienced and *licensed* man, and hide behind the obvious subterfuge that the *firm, and not a particular individual, was in responsible charge of construction.*

Coming back to the proposed Illinois Registration Law, let us examine the exemptions thereunder. Referring to Section 3, sub-section (a) we read: "Draftsmen, students, clerks of work, superintendents and other employees of registered professional engineers *when acting under the immediate personal supervision of their employers.*" Now what constitutes "immediate personal supervision of their employers?" Does it mean that if a member of a Consulting Engineering firm sends out on a job, an unlicensed man (to whom incidentally he will not be obligated to pay a salary commensurate with the training and experience of a more qualified man) and then visits the site of operations once per month, that he will be upheld by the Board of Education and Registration? The writer has every reason to believe that this condition will obtain and the question now arises—OF WHAT VALUE TO THE RANK AND FILE OF THE ENGINEERING PROFESSION IS A LAW WHICH CONTAINS SUCH A LOOPHOLE?

But we are told that now is no time to make such minor changes. We must first make certain that a Registration Law is incorporated into the Laws of the State. It can be amended later when all fear of opposition has passed. My fellow-engineers, nobody has been more eager than I to do his part to stop chiselling. I have become nauseated by the denunciations of unethical practices within our ranks by men high in the councils of the older guilds and have discovered that these are the same men who will look you in the eye, blushless and unashamed, and offer you 150 dollars per month for important work, knowing full well that they could get away with it. The Wisconsin Law has been in operation for some time now. Has the abuse I pointed out been corrected? IT HAS NOT. Only as late as yesterday was a decision handed to me by the Secretary of the Wisconsin Registration Board involving a complaint by me against a Resident Engineer in charge of construction and the gist of the decision was that *a Resident Engineer in charge of construction is not in responsible charge of construction.* His firm is. Truly a perfect example of remote control. The time to write a good, firm, undeviating law is NOW.

The National Society of Professional Engineers came into being as a protest against the laissez-faire attitude of certain engineering organizations which were too busy working out formulae to pay much attention to the economic status of the engineer. No. 3 of the objective of the N.S.P.E. reads "To strengthen, unify, extend, and enforce State legislation protecting the public welfare, the practice of engineering, and the designation "Engineer." The Illinois Society of Engineers is the State organization of the N.S.P.E. It devolves upon the Illinois Society of Engineers to take cognizance of the weakness of the proposed law and take steps to amend it to the end that we who have served our apprenticeship may not be forced to compete with indifferently trained men in the construction field. FAILURE TO INCLUDE DEFINITELY THE ENGINEER IN ACTUAL CHARGE OF CONSTRUCTION, IN THE PROVISIONS OF THE ILLINOIS REGISTRATION LAW, WILL NOT BETTER THE ECONOMIC STATUS OF THE RANK AND FILE OF THE ENGINEERING PROFESSION.

WILLIAM STACK.

Editor: AMERICAN ENGINEER:

I am glad that the question of the necessity for bringing the Resident Engineers on construction within the provisions of the various Registration Laws, was to have been given due consideration at the meeting of the National Board of Directors in Washington.

A letter from Prof. H. E. Babbitt, Secretary of the Illinois Society of Engineers, informs me that my article on Registration will be published in the April issue of the *Illinois Engineer.*

Outside of the field of mechanical engineering, employment in the other fields appears to be in a bad way and I certainly appreciate your inserting my advertisement in THE AMERICAN ENGINEER.

I left last month's issue of the AMERICAN ENGINEER in the reading room of the Engineering Societies Employment Service here in Chicago and to-day, the manager told me that several of the A.S.C.E. members had inquired about the "new" society.

Very truly yours,

WILLIAM STACK.

POWER SHOW

Chicago Exposition of Power and Mechanical Engineering
International Amphitheatre,
Chicago, Ill.

A new Power Show for the mid-west—the Chicago Exposition of Power and Mechanical Engineering has been announced. The place is the new International Amphitheatre at Chicago, and the dates are October 4 to 9, 1937. The important consideration in connection with the announcement of this event is that it is to be under the same management which, over a long period of years, has conducted so successfully the National Expositions of Power and Mechanical Engineering at Grand Central Palace in New York. The new Exposition is not intended to supplant the National Power Show at New York, nor to interrupt its sequence. The next one, the Thirteenth National Exposition of Power and Mechanical Engineering, will be held at Grand Central Palace in New York, December 5 to 10, 1938, retaining the biennial interval now established.

Realizing the extent of the United States and the territorial interests involved, it is natural that the International Exposition Company should conduct expositions both in New York and Chicago. The interests to be served are so great and the potential audience so large that this exposition "localized" is entirely justified.

NEWS OF STATE SOCIETIES

TO ALL STATE SECRETARIES:

We welcome news from the State Societies and the individual Chapters! Help promote your State and National Society by sending us news letters regularly.

THE EDITOR.

UTAH

The late Alfred Alsaker, a well-known Electrical engineer, designer and inventor, devoted much time and study to social problems. He was quite radical in his youth and although he accepted and enjoyed the rewards that capitalism gave him for his work he did not believe in the rightness of the system until he had thought out the theory of the working of it. This is the material of his book, "The Capitalistic System and the Nature of Unemployment."

In this book he says—"I conceived the idea of analyzing the general behavior of the capitalistic system by the methods commonly applied to engineering problems—I expected that an impartial analysis would prove the capitalistic system to be inherently unstable and detrimental to the worker's interests—My expectations were not fulfilled, however, and I was somewhat chagrined when my analysis showed that my former understanding of the capitalistic system was superficial and erroneous."

* * *

Yellowstone Lake is so large that its water follows the curvature of the earth and is 57 feet above a straight line projected from one beach to the other. (*Science News Letter*).

* * *

"Before 1891, Death Valley, California was considered practically barren of life; but since then over 500 species of plants and over 100 birds have been found there below sea level."

* * *

Hydroponics, a new word in the world of science, means the raising of vegetables, flowers and fruit without soil, in tanks of warmed, fertilized water. Hydro is Greek for water and ponics is from the Greek word for labor, hence, water-labor or water-work becomes hydroponics.

* * *

During January the meteorologists tell us that Tennessee, Kentucky, Ohio and Indiana had three times the normal rainfall for that month. It was the heaviest January precipitation on record for these states.

* * *

Following complaints from officers and members of the National Society of Professional Engineers, the New York State Education Department investigated a well advertised commercial school giving a short course in the operation of Diesel engines and styling itself a "Diesel Engineering School." Under Article 66 of the State Education Law, the public authorities ruled that it was unlawful for an unauthorized institution to call itself an "Engineering School." To satisfy the requirements of the State Education Department, the name of the institution has now been changed from "Diesel Engineering School" to "Diesel Engine Institution." (THE AMERICAN ENGINEER).

Don't forget the Engineers Week at the University of Utah the last week of this month. Many interesting exhibits are in preparation for the event, and several exceptional talks are scheduled on the program.

* * *

In an address at the Third World Power Conference held in Washington, D. C. in September, 1936, Dr. Wm. F. Durand challenged the engineering profession with the statement that "we (engineers) cannot evade the responsibility which rests upon us to take our due share, even the lead, in the study of the problems which our own activities have, in a large measure developed."

* * *

Geophysicists should now have an opportunity to check their theories of isostasy, that the earth's crust floats upon a heavier lower material in a plastic state. Lake Mead will weigh 41,500,000,000 tons, which is a lot of weight to concentrate on one small area of the earth's surface. Benchmarks have been carefully placed by the Coast & Geodetic Survey and will be checked periodically.

* * *

To bring water to Salt Lake City from the Deer Creek Project; surveys have been made of several alternate high—and low—elevation alignments for the construction of a 54—and 72—inch aqueduct.

* * *

With a device like a giant cooky-cutter, engineers have just completed a 1125 foot mine shaft with a five foot diameter. Sections of rock weighing up to 11 tons each have been lifted from the smooth-walled shaft. Mr. J. B. Newson, mining engineer of the Idaho-Maryland Mines Corporation is responsible for the device.

* * *

Studies in Connecticut indicate that the fastest automobile drivers have the most accidents. The fast drivers are those who travel over 50 miles an hour. The moderate driver travels from 35 to 45 miles an hour. Thirty per cent more of the high speed drivers had accident records than those of the moderate speed group. (*Science News Letter*).

* * *

The electric power output for 1936 was 113,473,000,000 KWhrs. Water power furnished 40,893,000,000 KWhrs. and fuels 72,580,000,000 KWhrs.

* * *

With the Boulder Dam power development only 30 miles away, Las Vegas, Nevada has plans maturing for a new municipal power plant and distribution lines. A bond issue of $250,000 has been authorized and work is scheduled to begin at an early date.

* * *

In Germany, aluminum is being used to replace copper and brass in the electrical field, it is extensively used in airplane and airship construction and will doubtless play a more important part in automobile building.

* * *

New fields of usefulness for cement are being found constantly. One that attracted considerable attention in 1936 is the construction of cement-hardened stabilized roads. Dry portland cement is mixed with road soil, which is then thoroughly pulverized, moistened, compacted and rolled. When the cement sets, a hard surface results. Experimental sections of such roads have been built in several states. (*Mineral Trade Notes*).

* * *

Glass is becoming increasingly important as a material of construction. An office building consisting largely of glass was erected in New York recently, and 800,000 glass tiles were used in the ceiling of the new midtown Hudson tunnel at New York. Panels of glass blocks set in brick walls serve as windows in factories.

* * *

Each day the coal mines of the Ohio Rivers headwaters pour some 20,000,000 pounds of concentrated sulphuric acid into the beautiful Ohio. Engineers are seeking some way to prevent this great menace to downstream cities water supply, navigation and public health.

RALF R. WOOLLEY,
Secretary,
303 Federal Bldg., Salt Lake City, Utah.

INDIANA

One hundred and sixty members representing all sections of the state attended the April meeting of the Indiana Society of Professional Engineers at the Cropsey Auditorium in Indianapolis. President Cohen opened the meeting by giving a comprehensive analysis of the activities involving the various committees during the past month.

Engineer Smythe, chairman of the Membership Committee, reported 80 new memberships since the last monthly meeting, making a total of 306 members and representing 26% of all registered engineers in the State. This organization is now the largest and strongest group of engineers in the State of Indiana. Local chapters are now to be established in the various sections of the State, the first petition for a local chapter being presented by a delegation from Lake County.

Engineer Earl Carter, chairman of the nominating committee presented a list of permanent officers for consideration as follows:

President—Sultan G. Cohen, Indianapolis
1st Vice-Pres.—M. G. Johnson, Indianapolis
2nd Vice-Pres.—K. E. Lancet, Indianapolis
Secretary—J. V. Smythe, Indianapolis
Treasurer—H. O. Garman, Indianapolis

As directors, six of the following nine:

Ray H. Bower, Seymour; Charles Hunnell, Jr., Vincennes; Walter H. Meitz, Ft. Wayne; C. Grey, Indianapolis; Carl M. Geupel, Indianapolis; Edwin F. Shoenbeck, Gary; L. T. Gootee, Indianapolis; Donald H. Walker, Indianapolis; Clyde R. Yater, Shelbyville.

The nominations as presented were accepted and in addition, Earl Carter of Indianapolis was nominated as National Director by unanimous vote.

The Committee on Public Relations presented a resolution requesting the Indiana member of Congress to support a model bill covering activities of the Professional Engineers in the District of Columbia. This resolution was accepted and met hearty approval.

In addition to discussion of a number of important features, short talks were made by B. Hoffman, Valparaiso, late member of the Indiana Legislature and Henry B. Steeg, City Engineer, Indianapolis.

The next meeting of this organization is scheduled to be held on Friday, May 7th in Indianapolis; the place of meeting will be announced at a later date.

The monthly meeting of the Indiana Society of Professional Engineers was held March 12 at the Cropsey Auditorium in Indianapolis, approximately 150 engineers attending and representing all sections of the State excepting the North-eastern and Southwestern districts. Engineer Sultan G. Cohen, president, presided.

Engineer F. Y. Hardy of the State Highway Commission reported in detail regarding bills submitted during the present legislature, pointing out that some 27 bills contained clauses that in some way affected the engineering profession. The flood control bill affecting Marion County was given particular attention. It was also pointed out that between now and the next Legislature, steps should be taken to inaugurate constructive legislation affecting the engineer.

Engineer J. V. Smythe submitted a detailed report on membership in the seven territorial districts, and presented the names of 107 candidates who had applied for membership since the last meeting.

Following discussion of the invitation received by the Society to join the Indiana Engineering Council, during which Engineers Gorman, Carter, Brosman and Cohen presented the respective aims and purposes of each society, a committee was appointed to investigate and submit a report at the next meeting. A committee was also appointed to study employment conditions and salaries and wages in the Indiana State Highway Commission. The Structural engineers presented the situation regarding the issuance of Engineers building permits in the city of Indianapolis, and a committee will be appointed for a consideration of this matter.

Engineer Earl Carter representing the nomination committee, advised that two complete tickets would be presented at the next meeting with appropriated instructions regarding the holding of the election.

CONNECTICUT

FOURTH ANNUAL MEETING AND ELECTION

March 20, 1937—Hotel Garde
New Haven, Conn.

The Fourth Annual Meeting and Election of the *Connecticut Society of Professional Engineers* held March 20th, 1937 at the Hotel Garde in New Haven was called to order by the President, Harry E. Harris, at 3:15 P. M.

Those Present were: Benjamin H. Keeler, John C. H. Wendes, John W. Shallenberger, Edwin S. Ostayee, Laurence Fisher, Clarence C. Stevens, Frederick C. Mead, Leon E. Tuttle, Elmer H. Beard, Charles L. Mead, Alexander S. Lynch, John L. Harkness, Robert T. Hedrick, Joseph G. Crowther, Lewis C. Smith, Percival L. Davis, Robert Castro, Z. F. Cappabianca, William P. Little, Alfred A. Robinson, William J. Mahan, Samuel I. Sacks, Herbert H. Scott-Smith, Joseph H. Roberts, Charles R. Downs, James W. Phelps, Frank E. Kleist, John B. Walsh, Allen Hubbard, Dr. David B. Steinman, R. W. Loomis, H. S. Upton, Richard Lockwood, Carl Gotthardt and Harry E. Harris.

President Harris told of the work that the Legislative Committee has done in cooperating with the Power Engineers in trying to secure passage of a law for the registration of power engineers in Connecticut, and at the same time to see that there is no interference between the bill which they introduced and the law as it affects the Professional Engineers. He also reported the appointment of a Sub-Committee of the Legislative Committee to cooperate with the Power Engineers and of the appearance of the Professional Engineers in Hartford on March 16th, 1937 when the bill came up for hearing before the Judiciary Committee.

The Brief to the Reorganization Committee concerning the Engineers' Board of Registration of March 12th which was presented at Hartford, was read by Secretary Gotthardt.

President Harris, appointed as delegate to attend the hearing on State College at Hartford, briefly outlined the important work carried on by the Society in aiding State College in securing their needs, as contained in a written report from the Legislative Committee. Discussion followed during the course of which Engr. Lynch stated as his opinion that Connecticut State College was founded as an agricultural college, limited to 500 students, and that therefore additional expenses should not be put upon the taxpayers, and that this college is not needed at all in the State since there are many Junior Colleges and others such as Yale, Trinity and Weslyan where the tuition fee is $1,400, just a difference of $1,000 between the cost of attending State College. Engr. Harris explained the advantages of this college such as low cost education, and the maintaining of our students within our own state, about 57% of which are at present seeking such education in other states and about 50% of which never return to the State. Then Engr. Harris informed those present that Connecticut State College was supported in a larger proportion by the Federal Government and its own earnings than by the State of Connecticut. The letters and report were accepted and placed on file.

Upon information received that the Appropriations Committee had reduced the proposed allotment per capital construction at Connecticut State College from $3,000,000 to $770,000, which is less than enough to meet the minimum needs, upon motion duly made and seconded, it was unanimously voted that this matter be referred to the Legislative Committee for further action with instructions to its Chairman to use his efforts to have this amount increased.

Since the work of the Society in regard to Connecticut State College was familiar to most members, the Resolution to the Appropriations Committee presented on March 10th by Engr. Harris, and the letters to the United States Congressmen and Senators of March 15th urging the support of the Bill H. R. 3629, providing for the Federal establishment of engineering experiment stations at land-grant colleges and from which Engr. Harris read several excerpts of interest, upon motion duly made and seconded, this material was accepted and placed on file, and the action of the Legislature Committee approved.

Engr. Harris then pointed out in the February Issue of the AMERICAN ENGINEER material concerning Connecticut Society, and also urged the members to secure advertisements for the AMERICAN ENGINEER. Some engineers present volunteered to contribute material for publication to Editor Craig. Engr. Hubbard reported that he had not received any copies of the AMERICAN ENGINEER and it was suggested that hereafter in order that the Secretary not be burdened with these complaints, that the individuals who do not receive the copies, write direct to Engr. Willard S. Conlon, Executive Secretary, National Society of Professional Engineers.

Secretary Gotthardt reported on the very favorable meeting held in Paterson, N. J., January 16th, 1937 by the New Jersey Association of Professional Engineers and Land Surveyors and exhibited a photograph taken.

The Financial Report of the Regular Meeting of the Connecticut Society of Professional Engineers held December 12th, 1936 was read by Secretary Gotthardt, showing that all expenses outside of typing, folding, mailing and other office work were cleared by $1.96, was accepted and placed on file.

Chairman Beard of the Resolutions Committee presented five resolutions at this meeting for consideration:

1. Resolution on the Reappointment of Engr. Cone to the Engineers Board, with letter to Governor Cross. Unanimously approved.
2. Resolution on Employment of Professional Engineers in Flood Prevention work. Unanimously approved.
3. Resolution on Establishment of Dept. of Public works in Executive Branch of the Federal Government. Unanimously approved.
4. Suggested resolution on fair practice by members of College Faculties. Upon motion referred to Legislative Committee for further study.
5. Resolution in opposition to increasing the Supreme Court. Upon motion duly made and seconded, this Resolution was tabled.

"When funds are available, the code of Ethics and Practice of February 25th are to be printed and distributed to the membership for criticism or approval."

Under "Unfinished Business" there were a number of measures now pending at the Connecticut General Assembly or in the United States Congress of interest or affecting the engineering profession. The following list of bills were reported:

1. Connecticut Valley Flood Control Bill —H. R. 4811.
2. Act concerning licensing of Power Engineers—H. B. 594.
3. Act concerning licensing of persons operating boiler of engine in buildings—H. B. 774.
4. Act concerning licensing of persons operating boiler or engine in buildings—S. B. 564.
5. Act concerning Architectural Engineering Board—H. B. 768.
6. Act creating licensing board of electrical contractors—H. B. 1372.
7. Report of Conn. Commission Concerning Reorganization of State Departments.
8. Reorganizing examining and licensing Boards—S. B. 591; H. B. 815.
9. Licensing of Real Estate Brokers—S. B. 545. This act will prevent engineers from appraising property.
10. Electrical Administrative Board—S. B. 987.
11. Conservation Bill—H. R. 7086.

New Officers were elected as follows:

President .....Allen Hubbard, New Haven
1st Vice-Pres. .William P. Little, Bridgeport
2d Vice-Pres. ..Kingsley Gillespie, Stamford
Secretary .....Lewis C. Smith, New Haven
Treasurer ....Chester S. Wendell, Stamford
Nat'l. Director .Harry E. Harris, Bridgeport

Auditing Committee:
Robert Castro, New Haven,
Albert W. Hagan, Bridgeport,
Edwin S. Osteyee, Bridgeport,
Z. F. Cappabianca, Stamford.

The new officers were then installed and Retiring President Harris presented President Allen Hubbard with the gavel. A vote of thanks was given the Past President and the other out-going officers.

Much discussion took place in regard to

the July, 1937 Meeting as to whether it be in the nature of a Shore Convention and Ball including ladies. A motion was presented that the July meeting be held at a date to be determined at which there will be a short Business session followed by a dinner and some sort of entertainment in the evening to which ladies will be invited.

"The president was empowered to appoint members of the membership committee in sections of the State where there is no Chapter, as District or Regional Representatives to cooperate with the Board of Directors at its regular meetings."

CARL GOTTHARDT,
Secretary.

RESOLUTION
on the
STATE BOARD OF REGISTRATION FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS

WHEREAS, the *State Board of Registration for Professional Engineers and Land Surveyors* and each of its members have performed their important duties to the State, its citizens and the engineering profession in a wise, impartial and creditable manner, and at considerable sacrifice have freely given of their time and abilities in the discharge of their difficult duties;

AND WHEREAS, the term of Board Member Joseph Warren Cone expires on June 30th, 1937,

BE IT RESOLVED, that the *Connecticut Society of Professional Engineers, Inc.*, gratefully acclaims and sustains the appointments made by His Excellency, Governor Wilbur L. Cross, of the present personnel of the State Board,

AND BE IT FURTHER RESOLVED, that his Excellency, the Governor, be requested to reappoint Joseph Warren Cone to succeed himself as a member of the Board, in view of the able and faithful service that he has rendered as a present member of the Board.

The above Resolution was unanimously passed at the Regular Annual Meeting of the *Connecticut Society of Professional Engineers, Inc.* held at New Haven, Connecticut, March 20, 1937.

RESOLUTION
CALLING UPON THE EXECUTIVE BRANCH OF THE FEDERAL GOVERNMENT TO EMPLOY PROFESSIONAL ENGINEERS FOR FLOOD PREVENTION WORK

WHEREAS, a flood of major proportions is being experienced in the Ohio and Mississippi Valleys with attendant deplorable loss of life and property, and

WHEREAS, the Federal Government is rightly considering the erecting of an agency to formulate plans and executes such measures as will prevent the recurrence of such catastrophies, and

WHEREAS, such an undertaking is essentially technical in its nature, and its manner of prosecution and its ultimate success are of vital importance to public welfare, now, therefore,

BE IT RESOLVED, that the Connecticut Society of Professional Engineers, Inc. respectfully requests the Federal Government to employ Registered Professional Engineers in all positions on such work for which engineering training is pre-requisite, and

BE IT FURTHER RESOLVED, that the Secretary of the Connecticut Society of Professional Engineers transmit a copy of this Resolution to the President of the United States and to members of the Congress for the State of Connecticut.

RESOLUTION
ENDORSING THE PROPOSED ESTABLISHMENT OF A DEPARTMENT OF PUBLIC WORKS FOR THE EXECUTIVE BRANCH OF THE FEDERAL GOVERNMENT

WHEREAS, the President of the United States has recommended to the Congress that a Department of Public Works in the Executive Branch of the Federal Government be established, with a Secretary of Public Works in the President's Cabinet, and

WHEREAS, such a Department has been recommended for many years by national organizations and persons of prominence, and

WHEREAS, we believe that such a Department is most decidedly in the public interest, now, therefore,

BE IT RESOLVED by the Connecticut Society of Professional Engineers, Inc. that the establishment of a National Department of Public Works be heartily endorsed, and that it be recommended that the same be headed by a Registered Professional Engineer, and

BE IT FURTHER RESOLVED, that the Secretary of the Connecticut Society of Professional Engineers, Inc. transmit a copy of this Resolution to the President of the United States and to members of the Congress for the State of Connecticut.

PROPOSED FORM OF RESOLUTION COVERING PRACTICE OF COLLEGE FACULTY MEMBERS, WHERE INADEQUATE FEES ARE CHARGED

Calling the attention of the Presidents and Board of Trustees of universities and colleges to the outside professional activities engaged in by members of the faculties of their institutions and urging them to prohibit their faculty members from engaging in such professional activities at fees below the recognized professional standards as adopted by ————————Society of Engineers.

———

WHEREAS, instances have occurred wherein members of the faculties of universities and colleges have been employed in private engineering practices, without fees, or at less than the recognized schedule of fees, and

WHEREAS, material harm is done to the engineering profession by such practice, and

WHEREAS, this Resolution is not directed against tests, reports, investigation, and/or research which lead to the extension of knowledge, which activities this Society commends and endorses for the reason that we believe teachers of engineering should be expected to keep their professional skill and experience; but professional service without pay or at fees lower than the ————————Society of Engineers' standard, damages the whole profession and is objectionable, and

WHEREAS, definite action concerning outside practice by university or college faculty members is not without precedent, the University of California and the Case School of Applied Science prohibit such practices as are covered by this Resolution, and

WHEREAS, the objection of Professional Engineers to such practice is that it is unethical that an institution engaged in the work of preparing men for the practice of engineering allow itself to compete or its faculty members to compete unfairly with the men it has so trained, or as employers maintaining offices and organizations necessary to serve the public according to recognized standards of present day specialized professional practice, now, therefore,

BE IT RESOLVED, that the ———— Society of Engineers does hereby condemn such unfair practices, and

BE IT FURTHER RESOLVED, that this Resolution be transmitted to the President and Boards of Trustees of universities and colleges for consideration, and for such action as they may deem desirable for the benefit of the engineering profession, and the safeguarding of the interests of the universities and colleges.

CHANGE OF ADDRESS

If the address at which you receive your AMERICAN ENGINEER has been changed, notify the Executive Secretary (*not* the Editor) without delay!

—Don't Forget—

All notices of change of address should be sent promptly to:

WILLARD S. CONLON
Executive Secretary
National Press Building
Washington, D. C.

PENNSYLVANIA

PITTSBURGH NOTES

The Pittsburgh Chapter met in the Dutch Room of the Fort Pitt Hotel, Thursday evening. Engineer Hutchinson, Chapter President, introduced Mr. Artemas C. Leslie, member of Allegheny Company Bar, who addressed the Chapter on the subject "The Engineer in the Court Room." The subject was generally discussed by those present.

The question of how the Engineer should qualify as an expert witness came up. It appears from the attorney's view that experience record should be the basis of qualification. It is wondered whether the fact of registration under the laws of the State as an engineer should not be sufficient for the general qualification with evidence of special knowledge in a special line for any specialist evidence. Engineers were reminded that the existence of the Engineers License Law on the statute books of Pennsylvania is not generally recognized nor its implications understood. The Meetings Committee will endeavor to have a judge of the courts discuss this feature before the chapter soon.

May we extend our congratulations to Engineer B. M. Alexander, President of the Reading Chapter. A campaign such as you have started is needed throughout the State. Pittsburgh Chapter is also pushing the campaign to eliminate firms illegally advertising themselves as Engineers. It is suggested that all the Chapters get behind this movement. How about all the Chapter Ethics and Practice Committees contacting the State Committee with a view of coordinating and uniting our campaign to eliminate this evil from Pennsylvania.

In connection with the campaign to eliminate the use of the words Engineer, Engineering, or Engineers from the title of Corporations or firms; the Attorney Generals office has ruled it as not illegal to use these terms in the title. It is put as follows: Section 202 of the Act of May 5, 1933, P. L. 346, as amended, prohibits the use of certain words in the title of corporations, but it does not prohibit the use of the words Engineer, Engineers, or Engineering. —*Pittsburgh News Monthly Bulletin.*

* * *

Chairman Sub-Committees: Please send to Eng. J. D. Stevenson, 421 City County

Building, any of the following cards that you may have:

J. M. Rice, Carl Vetter, Wesley Wolffe, F. B. Chalfant, C. H. Barrett, H. S. Ayres, I. Chas. Palmer, Chas. F. Brown, A. H. Doering, Wm. C. Donnan, L. C. Gerber, Frank Hawkins, G. L. Hendrickson, Wm. Hirsh, Al. Mauch, Richard Neff, J. J. Paine, Nathan Schein, George Shusler, Sam Soffel, Fred Evans, John Whitney, C. B. Stanton, Arch Nance, Chas. F. Miller, E. D. Hershberger, T. J. Wilkerson, Walter Church, Chas. Fox, Joseph Lambie, Edward Keen, Carl A. Bauman, Wm A. Fox, H. K. Keil, Louis Vierheller.

* * *

Ben Aires has increased his walking speed. Perhaps E. E. Apple talked him into using Gulf Gasoline.

* * *

The West Chester County Chapter has an attendance prize. Do you think it necessary for us to do the same in order to get *you* at the meetings?

* * *

Bob Horne says: "The most efficient way to keep the Roads clear of snow and ice, is to prevent weatherman Brotzman from forecasting it."

* * *

Vice-Chairman Canfield and Director Ducey have recently joined the sit down strikers. Well, at least we often have noticed them lunching together and forgetting the one o'clock deadline.

* * *

Chairman Hutchinson had a fire at his office. Fortunately not much damage was done.

* * *

Eng. B. Aires has several hundred copies of the Constitution, which are available on request. Write, Ben Aires, 610 Maloney Bldg. or call him at CO 0128.

* * *

Eng. Brunn, Electrical Engineer, is devising a new apparatus to send electrical impulses into the Membership Committee.

* * *

The Meetings Committee is glad to announce that Dr. Robert E. Doherty, President, Carnegie Institute of Technology, will be Guest Speaker at the April meeting of the Chapter. Dr. Doherty's subject will be, "The Engineering Profession."

* * *

One of our members can give a Structural Engineer about 6 or 8 weeks work. If interested, get in touch with the Secretary.

NEW YORK

Examinations for registration of Professional Engineers and Land Surveyors will be given by the New York State Board of Examiners on July 6, 7, and 8 at Albany, Buffalo, New York, and Syracuse. It is expected that assignments to these examinations will be limited to candidates who filed their applications prior to January 1, 1937.

SHOULD HE BE REGISTERED

Copy of experience statement on an application for registration as a Professional Engineer in New York State:

1911-1917—Machanic at Dry Dock & Repair Co

1917-1920—Sergant U. S. Enginerc, U. S. Army.

1920-1936—General Superintendent, Dry Dock & Repair Co.

(This candidate is a Member of one of the prominent national technical societies).

The 166th meeting of the N. Y. State Board of Examiners of Professional Engineers was held at New York City on March 12th and 13th, 1937. At this meeting, the Board interviewed 45 applicants and of these scheduled 15 for written examinations, rejected 24, and passed 6.

Following previous review of each case by the individual Board members, a total of 561 applications were considered at this meeting. Of these, 170 were scheduled for written examinations, 145 were rejected, 74 were held for further consideration, and 172 were approved for license.

* * *

THE HUDSON ENGINEER

Published monthly by the Professional Engineers Club of Hudson County

Volume 1 MARCH, 1937 No. 1

With this initial issue, the *Hudson Engineer*, to be the voice of the Professional Engineers Club of Hudson County, makes its bow. It will present monthly to members the monthly meeting notice, items and news of interest to professional engineers of Hudson County and general topics of current interest. It will be published in bulletin form until such time as sufficient news of interest to its members and advertising warrants its expansion to a pamphlet or magazine.

* * *

MARCH MEETING

Monday evening, March 22nd, 1937, 8:00 P. M. sharp. Public Service Auditorium, 84 Sip Avenue, Jersey City, N. J.

Guest Speaker—Russell Van Nest Black. Topic: "The Work of the State Planning Board."

* * *

1938 CONVENTION

The Professional Engineers Club of Hudson County will be host to the New Jersey Association of Professional Engineers at its Annual Convention to be held in Jersey City in January, 1938. Engineer Herbert Hartman, Chairman of the Arrangements Committee reports that from preliminary investigation, several thousand delegates from all parts of the State and the metropolitan district, will be present. Committees are already at work on plans for this Convention and from all indications it appears necessary to make it a two-day affair.

* * *

MEMBERSHIP

The Membership Campaign is now under way. Members of the Committee will canvass all licensed professional engineers in the County to secure their membership in the Club. You can do your part by bringing your professional associates to the meetings. Application blanks may be had on application to the Secretary.

* * *

Regional Plan study maps and the book "Mastering a Metropolis" are available to members in turn. If you desire to read this interesting book file your name with the Secretary.

* * *

LEGISLATION

Assemblyman (Engineer) McClave has introduced in the State Legislature a bill to provide for the securing of liens by professional engineers and land surveyors for services rendered. At the February meeting the Club endorsed the provisions of this bill and assured Assemblyman McClave of its support of this measure.

Engineers Runyon and Heilmann are now at work on proposed revisions of the licensing law. Copy of the revised act will be sent to all Chapters in the State as soon as it has been approved by the State Board and the Legislative Committee.

* * *

COMMITTEES

In order to avoid duplication of effort each Committee appointed by the President is required to appoint its own Committee Secretary and to perform its own clerical work and make its own reports in writing. This decision will, undoubtedly, relieve the Secretary of quite a little clerical work.

* * *

TIMELY NOTES

If you are not a member and have the necessary qualifications—JOIN .

If you are a member and have not as yet paid your 1937 dues—PAY.

If you are a member and your dues are paid and you know an engineer eligible for membership and can get a night off—BRING.

If you have any suggestions for the advancement of the Club—SPEAK.

If you are a member, paid your dues, brought a friend, and suggested too, come out on the fourth Monday evening of each month and—WORK.

* * *

WESTCHESTER COUNTY CHAPTER NEW YORK STATE SOCIETY OF PROFESSIONAL ENGINEERS, INC. CHAPTER NEWS

White Plains, N. Y. Vol. II, No. 8.
April 1, 1937.

MEETING

The annual meeting of the Chapter was held in the old Supervisor's Chamber, Court House, White Plains, on Thursday, April 1st at 8:15 P. M. In view of the amount of business to be transacted, no speaker had been scheduled.

PREVIOUS MEETING

A small attendance was on hand to view the talking pictures presented by the *N. Y. Sun* and also to consider important resolutions concerning the Commissioner of Public Works in the County and other matters.

ELECTION OF DIRECTORS

The report of the tellers, who met Thursday, March 18th, indicated the re-election of Ray Potter and Howard Barnes, the election of Andy Anderson and a tie between Geo. MacBeth and Jim Duffy.

NEWS

The suggestion contained in a resolution passed by the Chapter, to the effect that the Commissioner of Public Works under the proposed charter reform should be a licensed professional engineer was not adopted by the Board of Supervisors. It was supported by the minority. Nuf Said!

LEGISLATIVE PROGRAM

Measures approved

Senate Int. No. 550, Print No. (577) 1383 by Mr. Desmond.

Senate Int. No. 852, Print No. 931 by Mr. Desmond.

Senate Int. No. 1141, Print No. 1278 by Mr. Miller.

Senate Int. No. 1189, Print No. 1338 by Mr. Desmond.

Senate Int. Bill Int. No. 960 by Mr. Howard.

Assembly Int. 869 by Mr. Bartholomew.

Disapproved Measures

Senate Bill Int. No. 853, Print. No. 932 by Mr. Dunnigan.

Assembly Bill Int. No. 1494, Print. No. 1636 by Mr. Ehrlich.

Assembly Bill Int. No. 655, Print. No. 666 by Mr. Turshen.

Senate Bill No. 1113, Print. No. 1250 by Mr. Berg.

Assembly Bill Int. 1526, Print. No. 1670 by Mr. Mangano.

Assembly Bill Int. 1038, Print. No. 1401 by Mr. Dollinger.

Senate Bill Int. No. 456, Print. No. 473, by Mr. Berg.

Assembly Bill Int. No. 671, Print No. 682 by Mr. Gans.

Senate Bill Int. No. 106, Print No. 106 by Mr. Joseph.

Assembly Bill Int. No. 92, Print. No. 92 by Mr. Pack.

Assembly Bill Int. No. 236, Print. No. 236 by Mr. Moran.

Senate Int. No. 125, Print. No. 1336 by Mr. McCaffery.

Further details concerning these bills will be presented and appropriate action will be be taken at the Chapter meeting. In the meantime, write to your State Senator, assemblyman and Gov. Lehman.

Ted Coffin was among those present at the second and successful robbery of the Katonah Bank. He has been suggested as a speaker on "The Engineering of a Bank-Hold-Up."

Congratulations to the new Directors. The vote, while light, was exceedingly close. Only eight votes separated six of the ten candidates, thus emphasizing the importance of voting.

The new life in the AMERICAN ENGINEER deserves the support of all members. How about a County correspondent? These bulletins seem stale after two months. Is Westchester County the only Chapter in the nation with a monthly bulletin?

FRANCIS J. LAVERTY,
Secretary.

WESTCHESTER COUNTY CHAPTER

The regular meeting of the Bronx County Chapter New York State Society of Professional Engineers, was held at the Concourse Plaza Hotel, April 1, at 8:30 P. M.

An address was given by:

Dr. Clarence J. O'Conner,
President of the
Bronx County Medical Society

The Bronx County Medical Society and The Bronx Chapter of Professional Engineers have much in common; in that both are professional organizations, that both are standard bearers of honorable ethics and practice in their respective fields and that civic pride and civic protection are their foremost aims.

Chapter Business: disposition of Amendments to the Constitution, voted upon and discussed at the last meeting; legislation now in process outlined by Engineer Crinnion; standing Committee personnel announced; special Committees for specific problems requested; suggestions for participation in the N. Y. World Fair entertained.

RUDOLPH C. LANG,
President.
H. MCKEAN CONNER,
Secretary.

The annual meeting and dinner of the New York County Chapter was held Tuesday, March 30, and a fine turnout enjoyed an interesting evening, which included the election of officers for the year 1937-8, action and discussion (led by Dr. David B. Steinman) of some twenty bills affecting Engineers, now pending in Albany, and a short talk (illustrated by motion pictures) on "Fire Tests of Structural Materials" by Professor William J. Krefeld of Columbia University.

Engineer William H. Yates, Chairman of the Membership Committee, reported that 58 new members had joined this Chapter during the past fiscal year.

The officers newly elected to serve the Chapter are:

President
Harold Ranken Towse

Vice-Presidents
E. H. Praeger — Walter E. Bradley
Adelph C. Syska — Professor Henry C. Enders
Professor H. S. Roemmele

Treasurer-Financial Secretary
William H. Yates

Directors
for two years—1937-1938

Homer C. Balcom	Wm. John Krefeld
Walter E. Bradley	Geo. J. Nicastro
R. A. W. Carleton	John W. Pickworth
Malcolm Curry	George A. Sallans
Edwin A. Kingsley	Walter H. Weiskepf

IMPORTANT LEGISLATION

Dr. David B. Steinman, past National President, presented the legislation now pending at Albany in his usual interesting manner and following discussions, endorsement or disapproval was noted on same. Twenty bills affecting the Engineer, with instructions that letters be sent to the legislators in an effort to have proper action taken. Some of these bills have been sponsored by the State Society and introduced by State Senator Deswood of Orange County, the only Engineer in the New York Legislature. Senate Bill, Introduction No. 550, Print. No. (577) 1383 by Mr. Deswood, regarding supervision during construction and certificates before occupancy is in line with the report of the Chapter's "Committee on Safety in Construction" headed by Engineer G. E. J. Pistor, which was formed shortly after the tragic collapse of an apartment building.

RESOLUTIONS

Major Waugh, Chairman of the special committee appointed to study the question of the age limit as practiced by employers of engineers, presented a written report recommending that steps be taken to eradicate this condition through an active campaign among private and public employers of engineers.

This report will be sent to the State and National Societies.

Engineer Davidson, Chairman of the Patents Committee, was carried to request the National Society, through the State Society, to appoint a committee to cooperate with county chapters and all the associations who are seeking to improve the present patent laws.

NEW JERSEY

REPORT OF SENATE HIGHWAY COMMITTEE HEARING ON HIGHWAY DIVERSION BILL (ASSEMBLY NO. 60) HELD FEBRUARY 24, 1937

Arriving at the hearing ten minutes late, I was amazed to find that the hearing had been recessed for a short period. I was informed that when the case was opened for the Diversion Bill, no one came forward to speak, and that the recess was apparently called to give proponents of the bill more time to put in an appearance.

The Assembly Chamber and Gallery were jammed with opponents of the Bill. People were standing around the walls and in the corridor outside. Every few feet, all over the place, were signs "Stop Diversion." Not one sign or placard did I see favoring the bill.

When the chairman re-convened the meeting he again invited proponents of the bill to come forward. No one appeared. Such being the case, the case for the bill was closed, and opponents were invited to speak. Fifteen or twenty men, representatives of the Keystone Automobile Club, The A.A.A., the State Grange, the New Jersey League of Municipalities, a Manufacturing Association, the New Jersey Association of Engineers, the State Highway Commissioner and others spoke against the bill. The shocking unsafeness of our present highways, the unfairness of using sales tax on a single commodity for relief purposes, the unsoundness of financing relief out of earnings of the people who construct our roads (shown by studies to average less than $1,000 per year per individual employed and the tremendous economic importance of highway transportation to our people were among the principal arguments advanced against the bill.

I regret that I could not stay till the end of the hearing to listen to Commissioner Sterner. I understand from others that he gave an impressive array of facts to show that highway construction had been already terribly crippled by diversion, that the present highway program was almost entirely aimed at accidents on the road, and could materially reduce them on the highways included, and that the amount requested for 1937 construction, while justifying its expenditure in accident reduction alone, was only a drop in the bucket compared to the amount needed to make all of the State Highways safe. He paid tribute to the engineers of his department for the advanced work they were doing and stated that other countries, such as Germany and Italy, had sent sent engineering representatives to New Jersey to study our Engineers' developments in safe highways.

Your representative spoke briefly on the following outline:

A. Country shocked by 34 deaths on our airlines in two months.

I. During the same period 6,000 people killed on our highways.

B. What has the Engineer done toward safe highways? Has designed for us:

1. Divided Highways.
Cuts accidents in half.

II. Separation of Grades.

1. At principal intersections will cut accidents remaining on divided highway at least 50%.
2. Net reduction I and II—75%.

III. Adequate Lighting.

1. If night lighting could be made as effective as daylight, remaining accidents could be reduced 40%.
2. Taking credit for only half this 40%, Net Reduction I, II and III is 80%.

IV. Removal of Fixed Objects.

1. Poles from Right of Way.
2. Trees at least to extremities of Right of Way.
3. Traffic Lights suspended overhead, etc.
4. Estimated Net Reduction I, II, III, IV, 85% to 90%.

C. Contrast Highway of today with its toll of death and destruction with this Ideal Highway.

D. This Ideal Highway is being built today.

I. Not in New Jersey, although it is the N. J. Engineer's development and ideal.

II. Over 3,000 miles are being built—not in this Country—in Germany.

III. Germany cannot pay for these highways out of Gas and Motor Vehicle Taxes.

1. Has less than half the motor vehicle registration of the State of New Jersey.

IV. Germany willing to sacrifice in other taxes to obtain enormous economic benefit of a Developed Highway Transportation.

E. Sad thing in New Jersey is that the

Highway is producing the Revenue to Solve the Situation.

I. Improved Highways have paid.

1. N. J. fifth from bottom of list of States in tax per gallon.
2. N. J. fifth or sixth from top of list of States in total tax collected.

II. Diversion has thwarted safety construction.

F. Financing Relief out of Highway Construction Funds Unsound.

I. Men employed in Highway construction average less than $1,000 per year.

II. Thrown out of work, they are forced on relief.

G. A vote for this Bill is a vote for

I. Death and Injury on our Hiighways.

II. Untold loss to the people of this State.

S. HERBERT TAYLOR,
Asst. County Engr.,
Camden County.

Representing N. J. Association of Engrs. at Hearing by Appointment of the President, Engr. Beale M. Schmucker.

Mr. Ernest F. Weeks,
200 East Fifth St.,
Paterson, N. J.

Dear Mr. Weeks:

I have been requested by several of our members to urge upon Senator Ely, W. P. A. Administrator, that professional engineers be placed in the "exempt" class which provision would enable them to work 120 hours each month at the prescribed rate and would permit their selection without the necessity of certification for relief. This has been done in the case of a number of skilled trades inasmuch as there is admittedly a shortage of trained engineers, it appears the time has come for the same action to be taken in such case. Spence Hamilton states that it is useless for a local chapter to make this representation and on his suggestion I am forwarding the idea to you. Perhaps the re-establishment of rates might also be possible at the same time.

Yours very truly,
CHESTER MUELLER,
President,
Essex County Chapter.

President Schmucker stated that Mr. Geo. Beattie, State Director of Employment W. P. A. is now making up a new rate schedule to be published March 22d, and suggested that a committee be appointed to go into this rate schedule revision immediately:

Engr. Clarke was of the opinion that we are not fighting the battle of the licensed engineers who already have jobs paying well above the present W. P. A. schedule:

Engr. Tilton stated that W. P. A. projects should not be scheduled by counties with separate pay schedules for each county:

Engr. Brown presented the following motion:

President Schmucker be empowered to appoint a W. P. A. wage committee to act for the Association on the revised rate schedule now being set up by the W. P. A.

1—No, 15—Yes, Passed:

The following Committee was appointed by the President.

Chairman, Leo McKee, W. P. A., District No. 4.

Engr. Herbert Hartman, W. P. A., District No. 2.

Engr. Percy Bivins, W. P. A., District No. 1.

Engr. S. H. Taylor, Jr., W. P. A., District No. 5.

Engr. Harry Paff, W. P. A., District No. 3.

This Committee was instructed by the President to consult with and act through Miss Vann, State Director W. P. A. Women's and Professional Projects.

LAWYERS' BILL

That hardy perennial, the lawyers' monoply bill, is again underway at Trenton. This year the lawyers' lobby lost no time about it. It is already through the Assembly and every effort is apparently being made to force it through before the public opinion can be focused on it.

This bill is ostensibly to prevent the practice of law by those who are not lawyers. That is a worthy purpose, but under this innocent guise the bill actually makes it a misdemeanor to draw simple instruments of sale and leasing that have been standard practice for years in the real estate business, and in the transactions of banks, automobile dealers and all other businesses in which time-payments or evidences of obligation are involved. These simple instruments that are a part and parcel of the real estate business, the banking business and the time-payment merchandise business are standardized and simple. The men who handle them have used them competently and without trouble ever since such businesses have been in existence. The enforced payment of a lawyer's fee on all such transactions would be a boon for the lawyers, and that is very definitely the purpose of the bill.

The protection of the public is the window-dressing. Underneath that is a sinister purpose to write into New Jersey Laws, a club that would force a reluctant public to pay tribute to one class.

The pressure for the bill does not come in great measure from those established and reputable law firms that make the legal profession a respected and honorable one. The whole thing is no more worthy of the legal profession than ambulance-chasing and is twice as vicious.

GILBERT N. SWEET.

COMMUNICATION FROM AMERICAN ASSOCIATION OF ENGINEERS

Mr. Ernest F. Weeks, Sec.,
200 East Fifth St.,
Paterson, N. J.

Dear Mr. Weeks:

The Bureau of Labor Statistics tells us that 80 National, 42 State and 197 Local Engineering Societies act in the interest of engineers. There has never been an occasion in which all these agencies acted as a unit. Yet the veterans, the medicos, dentists, the farmers, industrial groups, and other professions demonstrate constantly that well organized minorities capably defend their own interests.

Engineers are not now interested in permanent solidarity, but we do have under way a specific project in which engineers may at least once experience unified action. The project is announced in the December issue of *Professional Engineer,* pages 28-30, copy of which is being sent under separate cover. We attach a tentative outline of the presentation of the plan that will be made to engineering affiliates.

Improving of engineering public relations is a cause to which all engineering organizations give allegiance. We believe that the plan we have developed is one that can be endorsed by any engineering group. In supporting it no expenditure of time or money is involved. We ask only that all engineering groups officially indorse the plan in order that it may be presented with the unanimous support of the profession.

Will you submit the material to your governing board and let us have its suggestion or comment? If the plan has its approval will you write us an official endorsement?

With best wishes for 1937, we are

Cordially yours,
M. E. McIVER,
Secretary.

This letter sent to all Engineering Societies—National, State and Local.

"ASK THE ENGINEERS" CAMPAIGN

Selling the Idea of Preventive Engineering for Economy in Public Works to

Johnny Q. Public
Engineering Knowledge and Judgment
vs.
Prodigal and Improvident Public Works
(Tentative Outline)

Plan in brief:

A selected list of industries affiliated with highway engineering is asked to participate in national advertising calculated to make the voters of the United States demand that engineering knowledge and ability be fully utilized in the *planning* as well as construction of highways.

Details of Campaign:

Each affiliate is asked to devote one of his newspaper and magazine advertisements during the month (or a portion of a radio broadcast) to the "Ask the Engineers" Campaign.

Each is asked to emphasize in his copy or script the benefit to industry of its full utilization of engineering ability; to point out the economy and efficiency that would result from similar utilization of engineering ability by the government in the planning as well as the construction of public works, with special reference to the highway field. (Later campaigns will expand the idea, including other engineering affiliates and applying the theory to all technological activities of government—federal, state and local). Special injunctions to be incorporated in copy should include:

Demand engineers for engineering jobs.

Demand the *best* engineers.

Demand rational planning rather than shortsighted local projects and uncoordinated development.

Demand engineering representation on all commissions and boards controlling highway development.

Strengthen and enforce engineering registration laws.

Strengthen civil service or merit system.

Abolish parochialism and patronage as they adversely affect appointment of best engineers or their tenure of office.

Let engineers rather than politicians plan your highways.

Utilize fully the knowledge, judgment and ability of your engineers in all civic and governmental affairs.

Diversion of Highway Funds

Coordinated Publicity:

Releases emanating from all interested agencies commenting upon the benefit to consumers of the full utilization by industries of the ability and judgment of their engineers; the wastefulness of government expenditures initiated without expert engineering approval; the value of "preventive engineering" in the determinative stage.

Soundness of the Plan

1. Goodwill or public relations value to advertiser; offsetting the effect of present and probable future labor controversies. Participation in civic education; better government campaign.

2. Palatable presentation of the "tax burden" difficulty: Asks not that industry be relieved of tax burden or that expensive public works be abandoned, but that expert advice be made available as to the feasibility and value of projects before funds are appropriated and tax burdens assumed.

3. Precedent: campaigns waged for medicine and dentistry and architecture and law for full utilization of services by society. (See advertisements in May, 1936 *Professional Engineer*, pages 14 and 16, of Parke Davis, Metropolitan Life, Squibbs, Pepsodent, Libbey-Owens-Ford, Guaranty Trust, etc.) Note the precedent set by automobile dealers in San Francisco area which paved the way for the building of the San Francisco Bay Bridge.

SOME STARTLING STATISTICS

Washington, D. C.—*Highway Press Service*—A nine-lane traffic jam, 8,600 miles long and extending completely around the United States, would occur if the more than 28,000,000 motor vehicles in the nation could be brought together, packed bumper to bumper, on one road, according to a statement recently released by the United States Department of Commerce through one of its broadcasts on great American industries.

Passenger cars would fill seven and one-half of the nine lanes and school buses would compose a column 455 miles long.

If all the agencies associated with motor vehicles were strung out along this 8,600-mile stretch, a dealer would be located every two blocks. There would be one or two service garages between each two dealers and filling stations would be situated only 132 feet apart.

"There is only one thought that I should like to add to the vivid picture presented by the Commerce Department's statement," said Charles M. Upham, engineer-director of the American Road Builders' Association, Washington, D. C., "If all the money collected in gas-tax revenues and then diverted to purposes disassociated with highway building and upkeep during the past five years, could be gathered together, dollar on dollar, at one time, just such a nine-lane super highway, 8,600 miles long around the country, could actually be built. And, what's more, arrangements could be made to handle the 28,000,000 vehicles without congestion."

Diversion, arch enemy of the construction and maintenance of adequate highways and croupier at the game of death on the roads of the states of the nation that have given no honest consideration to the building of safe highways, is finally being dealt direct and telling blows by several states awakened to the need of combating so gross an error.

Minnesota, Kansas, Colorado and Missouri have taken definite steps by passing constitutional amendments outlawing the use of gasoline and motor oil taxes for purposes other than the construction and maintenance of highways. In eight other states significant statutes are pending.

"It would seem," said Mr. Upham, "that, while legislation to date effects less than 25% of the total number of cases, the efforts of the American Road Builders' Association in fighting against the evils of diversion have at last begun to bear fruit and, even if a nine-lane super roadway is presently out of the question, there are existing today thousands of places immediately in need of good and safe two-lane highways."

THREE MORE REGISTRATION STATES

Word has just been received that the Engineers' Registration Law has been passed by the Georgia Legislature and that the Governor is expected to sign the Bill. Two weeks earlier, Engineers Registration Laws were enacted in Nebraska and Texas. This brings the present total of Engineers' Registration States to 38.

Engineer Samuel I. Sacks
Chairman, Legislative Committee
921 Widener Building
Philadelphia, Pa.

Dear Engineer Sacks:

The District of Columbia Registration Bill, H. R. 5683, of which a copy is enclosed herewith, was introduced by Congressman Millard of New York on March 16th. I learned from the Corporation Council of the District Commissioner's Office that the Bill has been referred to him for consideration, and will remain in his office for a week or ten days.

I attended a joint meeting of Member Societies of the District of Columbia Council of Engineering and Architectural Societies at the auditorium of the National Museum in Washington, Wednesday evening March 17th, at which time Engineer Steinman presented the pro's and Professor W. B. Kowenhoven of Johns Hopkins presented the con's on the Model Law. Dr. Steinman presented a clear cut picture of the Model Law.

Sincerely yours,
WILLARD S. CONLON,
Executive Secretary.

H. R. 5683
IN THE HOUSE OF REPRESENTATIVES
March 16, 1937

Mr. Millard (by request) introduced the following bill; which was referred to the Committee on the District of Columbia and ordered to be printed.

A BILL

To regulate the practice of professional engineering, creating a Registration Board for Professional Engineers of the District of Columbia, defining its powers and duties, providing penalties, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to safeguard life, health, and property, any person practicing or offering to practice the profession of engineering shall hereafter be required to submit evidence that he is qualified so to practice and shall be registered as hereinafter provided; and it shall be unlawful for any person to practice or to offer to practice the profession of engineering in the District of Columbia, or to use in connection with his name or otherwise assume, use, or advertise any title or description tending to convey the impression that he is a professional engineer, unless such person is duly registered or exempted under section 18 of this Act.

DEFINITIONS

Sec. 2. The term "professional engineer," as used in this Act, shall mean a person qualified to practice professional engineering. A person who practices professional engineering within the meaning and intent of this Act is one who holds himself out as able to perform, or who does perform, any professional service such as consultation, investigation, evaluation, planning, design, or responsible supervision of construction or operation in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects, wherein the safeguarding of life, health, or property is concerned or involved, when such professional services require the application of engineering principles and data.

The term "Board," as used in this Act, shall mean the Registration Board for Professional Engineers provided for by this Act.

REGISTRATION BOARD FOR PROFESSIONAL ENGINEERS; APPOINTMENT OF MEMBERS; TERMS

Sec. 3. A Registration Board for Professional Engineers is hereby created, whose duty it is to administer the provisions of this Act. The Board shall consist of five professional engineers, who shall be appointed by the Commissioners of the District of Columbia and shall have the qualifications required by section 4. The members of the first Board shall be appointed within ninety days after the passage of this Act, to serve for the following terms: One member for one year, one member for two years, one member for three years, one member for four years, and one member for five years from the date of their appointment, or until their successors are duly appointed and qualified. Every member of the Board shall receive a certificate of his appointment from the Commissioners of the District of Columbia and, before beginning his term of office, shall file with the secretary of the Commissioners his written oath of affirmation for the faithful discharge of his official duty. Each member of the Board first appointed hereunder shall receive a certificate of registration under this Act from said Board. On the expiration of the term of any member, the Commissioners of the District of Columbia shall appoint for a term of five years a registered professional engineer, having the qualifications required by section 4, to take the place of the member whose term on said Board is about to expire. Each member shall hold office until the expiration of the term for which such member is appointed or until a successor shall have been duly appointed and shall have qualified.

QUALIFICATIONS OF MEMBERS OF BOARD

Sec. 4. Each member of the Board shall be a citizen of the United States and a resident of the District of Columbia or its metropolitan area and shall have been engaged in the practice of the profession of engineering for at least twelve years, and shall have been in responsible charge of engineering work for at least five years.

COMPENSATION AND EXPENSES FOR BOARD MEMBERS

Sec. 5. Each member of the Board shall receive $1 per annum, and, in addition thereto, shall be reimbursed for all actual traveling, incidental, and clerical expenses necessarily incurred in carrying out the provisions of this Act.

REMOVAL OF MEMBERS OF BOARD: VACANCIES

Sec. 6. The Commissioners of the District of Columbia may remove any member of the Board for misconduct, incompetency, neglect of duty, or for any other sufficient cause. Vacancies in the membership of the Board shall be filled by appointment by the Commissioners of the District of Columbia for the unexpired term as provided in section 3.

ORGANIZATION AND MEETINGS OF THE BOARD

Sec. 7. The Board shall hold a meeting within thirty days after its members are first appointed, and thereafter shall hold at least two regular meetings each year. Special meetings shall be held at such times as the bylaws of the Board may provide. Notice of all meetings shall be given in such manner as the bylaws may provide. The Board shall elect annually from its members a chairman, a vice chairman, and a secretary. A quorum of the Board shall consist of not less than three members.

POWERS OF THE BOARD

Sec. 8. The Board shall have the power to make all bylaws and rules, not inconsistent with the Constitution of the United States and laws of the District of Columbia, which may be reasonably necessary for the proper performance of its duties and the regulations of the proceedings before it. The Board shall adopt and have an official seal. In carrying into effect the provisions of this Act, the Board may, under the hand of its chairman and the seal of the Board, subpoena witnesses and compel their attendance, and also may require the production of books, papers, documents, and so forth, in a case involving the revocation of registration, or practicing or offering to practice without registration. Any member of the Board may administer oaths or affirmations to witnesses appearing before the Board. If any person shall refuse to obey any subpena so issued—or shall refuse to testify or produce any books, papers or documents—the Board may present its petition to the District Supreme Court, setting forth the facts, and thereupon such court shall, in a proper case, issue its subpena to such person, requiring his attendance before such court and there to testify or to produce such books, papers, and documents as may be deemed necessary and pertinent by the Board. Any person failing or refusing to obey the subpena or order of the said court may be proceeded against in the same manner as for refusal to obey any other subpena or order of the court.

RECEIPTS AND DISBURSEMENTS

Sec. 9. The secretary of the Board shall receive and account for all moneys derived under the provisions of this Act and shall keep such moneys in a separate fund to be known as the professional engineers' fund. Such fund shall be paid out only by the secretary, upon itemized vouchers approved by the chairman and attested by the secretary of the Board. All moneys in the professional engineers' fund are hereby specifically appropriated for the use of the Board. The secretary of the Board shall give a surety bond to the Commissioners of the District of Columbia in such sum as the Board may determine. The premium on said bond shall be regarded as a proper and necessary expense of the Board and shall be paid out of the professional engineers' fund. The secretary of the Board shall receive such salary as the Board shall determine, in addition to the compensation and expenses provided for in section 5. The Board may employ such clerical or other assistants as are necessary for the proper performance of its work or may make expenditures of this fund for any purpose which, in the opinion of the Board, is reasonably necessary for the proper performance of its duties under this Act. Under no circumstances shall the total in payment of the expenses and compensation provided for in this Act exceed the total sum of the examination and registration fees collected as herein provided.

(Continued next month)

Permanent Values In Engineering Education

(Continued from page 10)

tune in it. The teacher has devoted his own life to a specialty. He is proud of the advances in his field and he proudly lays before the boys' eyes the wonders of its achievements. The boys love it. They become enthusiastic. They work hard. They shut out all non-related interests, first by necessity of keeping up their grades, finally by lack of appreciation of the existence of other fields. What results could more surely warm the hearts and preserve the enrollments of the specialty teachers?

But when the boy is graduated, what happens? Does he cling to his specialized career? Or does he take the best job he is offered, almost as a matter of course—whether it is in his special field or not. His parents, and oftentimes his teachers, support him in his decision. He may regret the bad investments he made in premature specialization which he didn't follow, but it is too late now. Anyway, he saw the value of the courses he pursued at the time he was in college—even if they never were valuable to him. Why regret what happened in a period of his life that was on the whole enjoyable anyway?

No one denies that there was *some* value in his enthusiastic pursuit of his specialty, even if he never once met it in his subsequent professional career. The objection that his future employers make is that this time would have been more profitably spent in learning to see his technical training in its proper background and perspective, in learning to understand the place and the problem of the engineer in society, as Compton puts it; in balancing his diet so that he can avoid technical rickets; in giving him a chance to develop "the vision and flexible technical capacity to meet the full range of engineering responsibility."

In the scope of this brief paper I shall not attempt to outline the means for developing this balance. The light cast upon our human problems by the greatest minds of all ages as it shines forth from the classics of history, literature, economics and philosophy, will indicate the trend of my thoughts, as well as those contained in the Wickenden suggestion and the M.I.T. move. Some men may be mere technicians by birth and unable to profit by anything but a vocational training. There should be and there are schools in America for training boys of this type. But no capable engineering student should be denied a chance at the permanent values of true engineering education. I believe it will be possible increasingly to convince parents of the wisdom of this plan in the future.

We have drifted comfortably along. Enrollments have held up well. Most of the graduates have been too busy for retrospection. Industry has found the stiff engineering courses an effective screen to sift out those boys who couldn't pass hard exams. The industrial leaders have left the engineering schools alone to work out their own solution, considerately giving advice on educational programs only when they are specifically asked for it.

But if engineering educators once realize, as I am sure they will, that the most valuable thing a boy can be offered in four years at college is the foundation of an education in science and the humanities, as contrasted with a specialized technical training. I know them well enough to feel sure that they will rise to the faithful discharge of that trust which parents and students have so solemnly imposed upon them.

(To all of which we add a loud "hurrah"—Ed.)

American Airships and the American Professional Engineer

(Continued from page 14)

policy of developing the science of lighter-than-air flights and has urged construction of a new superdirigible. The ship would be operated experimentally apart from the fleet.

The Goodyear-Zeppelin Corporation, at Akron, Ohio, staffed with German Zeppelin engineers, has assured the Navy such a ship could be built for about $3,000,000.

The Navy high command maintains such a dirigible would be the equivalent of a $10,000,000 light cruiser in fleet scouting, her higher speed compensating for her greater vulnerability.

The Navy plans call for "belly hangers," housing up to 10 airplanes. Planes would be launched and retrieved by a patented trapeze. An observer could watch an enemy fleet operations from a "subcloud car" suspended from a thousand-foot cable while the dirigible remained hidden from detection above the clouds.

The statement that "Navy experts already have planned for construction of a giant sky cruiser, exceeding the *Hindenburg* dimensions, to replace the U. S. S. *Akron,* lost at sea 2 years ago," again recalls my remarks printed in the *Congressional Record* of April 14, 1936, in which I said I believed the United States was once more chosen to be "the goat."

In reference to the paragraph "the Goodyear-Zeppelin Corporation of Akron, Ohio, staffed with German Zeppelin engineers, has assured the Navy such a ship could be built for about $3,000,000." I am wondering if a Zeppelin-type airship or the American suspension-bridge frame airship is referred to.

On October 29, 1934, the Honorable Ewing Y. Mitchell, then Assistant Secretary of Commerce, presented to the Federal Aviation Commission an airship-construction program endorsed by the Department of Commerce, and which Mr. Mitchell stated was prepared by the National Advisory Committee for Aeronautics. This program called for the construction of two Goodyear-Zeppelin airships, of 7,000,000 cubic feet capacity, which is the size of the *Hindenburg,* the first costing $6,500,000 and the second costing $4,250,000.

Now, according to press reports, the Goodyear-Zeppelin Corporation has assured the Navy a much larger airship "could be built for about $3,000,000." It seems that the past 20 months have reduced the cost of American airship construction very materially.

The demonstration made by the *Hindenburg* is worthy in that it shows the capabilities of large airships in transoceanic commercial service. If American engineers duplicated the *Hindenburg,* except in its frame, what could prevent such airship performing as well as the *Hindenburg?*

If the American airship frame was stronger, the airship would be safer; if American nonexplosive helium gas were used, instead of explosive hydrogen gas, the American airship would be much safer; if the American frame were of less weight, a more profitable pay load could be carried; and were the total engine power increased, the American airship would be faster.

I have introduced the bill, H. R. 12682, May 12, 1936, authorizing the construction and operation of two American trans-Atlantic airships, through a loan by the Secretary of the Treasury.

The effect of this bill is that Congress provides means for an organization of American engineers and business executives to solve the American airship problem, and to design, construct, equip, and operate American airships in overseas commercial service.

Concluded in the May Issue

PROFESSIONAL DIRECTORY

F. HERBERT SNOW
Consulting Engineer
Telegraph Bldg. Harrisburg, Penna.

Robert Hall Craig
Consulting Engineer
Public Utility » Industrial » Municipal
Design » Finance
HARRISBURG, PENNA. 57 William Street, N. Y.

Vesper A. Schlenker
Consulting Engineer
"Acoustics of Buildings"
Sound Proofing — Surveys, Measurements
Vibration Control — Specifications
Electro-Acoustic Systems — Original Design
420 Lexington Ave., NEW YORK CITY

Harry E. Harris
CONSULTING ENGINEER
Administrative Controls Manufacturing Methods
Development - Design - Equipment
Systems - Standardization
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Wm. H. Dechant & Sons
Frederick H. Dechant, CE-ME
Miles B. Dechant, Archt.
Reading, Pa.
WATER WORKS SEWAGE DISPOSAL
POWER » PUBLIC BUILDINGS » APPRAISAL

JOHN S. SHOLL
Consulting Engineer
WILMINGTON DELAWARE

TRIBUTE PAID TO ENGINEERS

Flood Control Work of Army Corps Praised By Propeller Club

Pittsburgh Post Gazette
February 20, 1937

At a meeting of the Propeller Club of Pittsburgh yesterday the members unanimously supported the Corps of Engineers for its efficient work planning for flood control works and its charge of rivers and harbors. The club opposes such bills, which from time to time are being introduced in Congress which endanger American standards and will jeopardize national defense in times of war. They especially oppose the Voorhis bill, known as H. R. 3614 which has for its primary purpose removal of rivers and harbor work from the corps of engineers to other Government agencies. Resolutions were adopted which will be presented to Congress.

Major H. H. Pohl, of Cincinnati, the guest speaker, brought the greetings of Colonel Roger G. Powell, division engineer. He said that the flood control work in the Ohio Valley is being co-ordinated and provides plans for a series of 39 reservoirs placed at strategic locations.

Reduce Flood Levels

Major Pohl assured the members that with these reservoirs built the flood levels will be reduced varying from eight feet at Pittsburgh to about two feet at Paducah. These reservoirs are to be supplemented by sea walls and levees protecting critical localities. Colonel Covell, district engineer here said, that Congress already has approved plans of the army engineers which would effectively reduce flood levels, and that if sufficient funds are alloted work will start early this summer on from one to four dams.

Alfred S. Osborne, vice-president and general manager of the Union Barge Line Corporation, said that the public has full confidence in the work of army engineers and that they have the support of the members. He said the work they performed in the recent flood proved their efficiency in time of disasters and the construction of levees in the Mississippi valley were such that they saved lives and property.

Frazier - Simplex
Incorporated
Washington Trust Building
WASHINGTON, PA.

Engineers to the
GLASS INDUSTRY

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Corrosion Studies

17 E. Main Street Waynesboro, Pa.

"Save the Structure" may well be the slogan of bridge engineers who, in 1937, are faced with the necessity of doing something about rapidly increasing live loads, great increases in traffic, and deteriorated roadway surfaces.

There is a direct solution in the use of Alcoa Aluminum to replace needlessly heavy floors and floor systems, railings and walk-ways.

Dead-load reduction with Alcoa Aluminum can add years of useful and safe service to thousands of existing bridge structures. Here are four things that may be accomplished: 1. Traffic capacity increased; 2. Permissible live load increased; 3. Roadway surface improved; 4. Stresses reduced.

Saving the structure with Alcoa Aluminum is good engineering, as several successful reconstruction jobs have proved. And it is good economics to avoid expensive new construction by a relatively small investment in sound improvement.

May we discuss the engineering considerations with you? ALUMINUM COMPANY OF AMERICA, 2112 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA ALUMINUM